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WALTER J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S.,
Principal.

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All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide "

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POINTS FOR PRODUCERS.

Farm Competitions.

The Naracoorte and Kybybolite Branches of the Agricultural Bureau have arranged for the fifth annual series of farm competitions to be held this year, and judging will take place during November. The eight classes for which prizes are being awarded are:—(1) Best worked and managed farm, 750 acres or over; (2) best worked and managed farm, area under 750 acres; (3) best growing crop of wheat; (4) best growing crop of oats; (5) best herd of cows; (6) best flock of sheep on a farm; (7) best kept orchard and vegetable garden; and (8) best flower garden. Arrangements are in the hands of the following committee of management:—Messrs. F. A. Holmes (chairman), S. H. Schinckel, W. Loller, J. Donoghue (hon. secretary), J. M. Wray (Naracoorte Branch), L. S. Davie, A. Bradley, S. Sheppard, C. Hahn, and H. B. Schinckel (Kybybolite Branch).

Nuts.

The filbert and hazel nuts grow well in light, somewhat sandy soil with a clay subsoil, whilst walnuts prefer a deep, loose, thoroughly well-drained, moist soil, with porous rather than clay subsoil, says the Horticultural Instructor (Mr. Geo. Quinn). He suggests planting the nuts in the positions in which the trees will grow permanently, setting two or three in each hole, covering them, say, 2in. deep, and firming the soil over them. This is only practicable where vermin and stock are rigidly excluded from the area. Failing this, the nuts should be sown in a prepared seed bed, dropping them in drills about 6in. apart, the drills being set about 2ft. apart from each other. The young plants may be transplanted any winter between the first and third years, but if left over the second year, the root system will be much cut in lifting, and the tops must be reduced in proportion.

Curculio Beetles.

The common garden curculio beetle (*Otiorrhynchus craticollis*) may be destroyed by spraying fruit trees with arsenate of lead, using the powdered form at the rate of 1lb. in 10galls. of water. If the paste form is used, 1lb. should be mixed in 5galls. or 6 galls. of water. This strength whitewashes the trees, but unless they are suffering from drought it will not injure them, says the Horticultural Instructor (Mr. Geo. Quinn). As this beetle does not fly, it may be prevented from climbing the stems of trees by binding strips of woolly sheepskins around each stem, tying the skin tightly around the top of the band. Collars of zinc may be similarly used around the stems. If only rose trees are attacked, the beetles may be caught on newspapers spread carefully beneath the branches at night, on to which the beetles may be caused to drop by jarring the plant.

A Distinct Loss.

There are 212 Branches of the Agricultural Bureau in South Australia. Each of these holds meetings, generally monthly. Papers are read, difficulties discussed, and every effort is made thus to help those who are engaged in agricultural pursuits. There are still, however, many farmers in this State who are not members of the Agricultural Bureau. This is their loss. It is also a loss to the State. Either they know all that is to be learnt about farming in their particular district, or they do not. If the former is the case, they could help their neighbors with their advice, which would be thankfully received. If the latter, well then, they are not availing themselves of their opportunities to the full. If you come under either of these categories, send a postcard to the Secretary Advisory Board of Agriculture, and ascertain the nearest Branch to your holding.

Agricultural Education.

The initial meeting of the committee appointed by the Government to formulate a scheme for the utilisation of Mr. Peter Waite's Urrbrae Estate, with a view to the development of scientific and agricultural education, was held at Government House during October. An address, outlining the objects of the committee, was delivered by His Excellency the Governor (Sir W. E. G. A. Weigall, K.C.M.G.). The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) also addressed the meeting. A subcommittee consisting of representatives of interested bodies was appointed to draw up suggestions, and report to the Committee.

SOUTH AUSTRALIAN WHEAT HARVEST BOARD.**EARLY DELIVERY OF NEW SEASON'S WHEAT,
1920-21 HARVEST.**

The South Australian Wheat Harvest Board desire to inform farmers that in their interests it is desirable that delivery of early-reaped wheat to the Pool should be made at the earliest possible date.

Both the shipping and market position is favorable to early shipment, and it is the Board's desire to ship away as much wheat as possible during the month of December, and for this purpose shipping tonnage has already been chartered to arrive.

Those farmers having wheat available for early delivery right through the month of December are therefore asked, in their own interests, to cart to receiving stations at the earliest possible date.

G. J. SMITH, Chairman.

S.A. Wheat Harvest Board Office,
Peel Street, Adelaide, November 8th, 1920.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by Mr. C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"C. L. V.," Salt Creek, asks:—1. What is a grain of strychnine. 2. Is it possible, through old age, that a cow should refuse to mate with a bull? 3. Mars with difficulty in swallowing; when drinking, commences coughing, and water comes out of the nose.

Replies:—1. A grain is the unit of weight. It is the sixtieth part of a dram. A threepenny piece weighs 20grs. 2. Yes. 3. The mare has a sore throat. This is a common complication in catarrh, influenza, strangles, and some other diseases. Supply her with soft food. Do not drench her. Give her the following medicine:—Green extract of belladonna, $\frac{1}{2}$ oz.; camphor, $\frac{1}{2}$ oz.; chlorate of potash, 1oz.; honey, 4ozs.; glycerine, 2ozs. Mix. Give one tablespoonful three times a day on the tongue and back teeth.

"E. F. N.," Mount Cooper, asks cause of and treatment for gelding passing blood in water.

Reply—This occurs most commonly in the following diseases:—Stone in the kidney, bladder, or urethra, injury, inflammatory conditions of the urinary organs. You should state the length of time affected, whether pain present, any difficulty in passing urine, whether the urine is stained uniformly or if clots are passed before or after urinating. The treatment of stone is surgical. Put him on cooling food, mashes, and green stuff. Give tincture of perchloride of iron, one tablespoonful twice daily in a pint of water for a fortnight.

Hon. Secretary, Agricultural Bureau, Pinnaroo, asks cure for warts on cow's teats.

Reply—I recommend the application of strong acetic acid. This preparation must be carefully used. Apply with a wooden match.

Hon. Secretary, Agricultural Bureau, Petina, asks cure for cow scouring.

Reply—Diarrhoea is a symptom of intestinal irritation. Keep her in and feed her. Withhold green feed until the scouring ceases. Feed her on bran and chaff and a little hay. Give her two or three doses of chlorodyne, 1oz. in half a pint of warm water, and take the chill off her drinking water.

"E. L.," Port Elliot, asks best method for drying off a cow.

Reply—The best method of diminishing the milk secretion is to withhold green feed. Supply as far as possible only dry food, and gradually lengthen the periods of milking. Do not strip her out. Alum is sometimes given for the purpose in doses of 2 teaspoonfuls twice a day. Dissolve it in a little warm water and give as a drench.

"P. W.," Mangalo, has pony that cut her hoof at the back of frog with piece of glass. Is it advisable to leave the shoe on?

Reply—I think it is advisable to remove the shoe. The wound must be protected from contamination. You may be able to do this by keeping the part covered with a piece of clean sacking. When she is in the stable keep plenty of clean bedding under her so that the wound does not become soiled with dung and urine.

If the wound is discharging, wash it out daily with carbolic, izal, kerol, or one of the coal-tar disinfectants, using a tablespoonful to a pint of warm water. If it is quite dry and making good progress dress it with Stockholm tar.

"J. F.," Gumbowie Siding, reports two horses large lumps on shoulders. Horses turned out for two months, but swelling just the same.

Reply—The only satisfactory treatment for the swelling which has been present for two months on the shoulders of your two draught horses is surgical. If dealt with in the early stages they may respond to simple treatment, but in such cases there is always a liability of recurrence with work. The condition is usually that of a very thick-walled abscess. Complete removal of the whole mass is the best course; failing this a deep incision into the centre of the swelling large enough to provide for drainage, and subsequent antiseptic dressing.

"W. E. M.," Port Pirie, has foal six weeks old, large swelling near side hind leg. A large lump, discharging matter, has also formed on chest.

Reply—The disease appears to be joint ill, due to infection at the navel before the wound had closed. It is probable that the foal will have permanent injury to the joint. Treatment should be adopted as soon as the first symptoms appear. Give quinine sulphate, half a teaspoonful, twice daily, mixed with a little treacle, and given on the tongue. Paint the navel and also the swelling with tincture of iodine. The disease can be prevented by allowing the mare to foal in clean surroundings such as a good grass paddock. The navel of the foal should immediately be tied with a ligature about 1 in. from the skin. Use a piece of tape dipped in carbolic solution. Cut off the navel cord below the tie with a sharp knife or scissors. Paint the stump liberally with tincture of iodine, and dress daily with this preparation for a few days, when the stump of the cord will have dried up and can be removed, and the navel painted with tincture of iodine or Friars balsam.

"J. T. M.," Mookra, reports blindness of two-year-old colt three days after castration.

Reply—The blindness is due to interference with the nerve supply of the eye. No treatment can be recommended. If due to disease of the nerve it is neuritic, otherwise it may disappear spontaneously.

"A. S. B.," Mangalo, asks cure for cattle and horses badly affected with lice.

Reply—A good, cheap remedy is kerosine emulsion, made by dissolving one pound of soft soap in a gallon of water and adding a pint of kerosine. Cut the soap up into shavings and dissolve in the water by simmering over the fire. When the soap is dissolved add the kerosine and stir vigorously. Apply thoroughly over the whole body. Repeat if necessary in a few days. Cooper's milk oil fluid is a good and inexpensive dressing. Use two and a half ounces to a gallon of water.

"A. C. T.," Wall Flat, reports cow with hair coming off neck and face.

Reply—The trouble is probably due to lice. Apply kerosine emulsion, made by dissolving one pound of soap in a gallon of hot water and adding one pint of kerosine by stirring vigorously. Apply this while warm. Make a second application, if necessary, in a few days.

"J. D. Mc.M.," Port Broughton, asks cause and cure for red water.

Reply—There are two forms of disease, one being due to the presence of a blood parasite, the other occurring most commonly in dairy cows within a short time of calving. Treatment:—Give a pint and a half of raw linseed oil, follow with carbonate of ammonia, 3oz.; powdered nux vomica, 1 dram; bicarbonate of soda, 1oz.; treacle, 1lb. Twice daily in a pint of water.

"F. N.," Meadows, has horse, 15 years, with short dry cough; number of threadworms noticeable in manure.

Reply—I recommend you to obtain 1lb. of Fowler's solution of arsenic. Give him one tablespoonful twice daily in the feed.

"A. E. H.," Wynarka, reports cow with hard flat lumps on the udder and teats. These later developed into boils and discharged matter.

Reply—The condition is apparently that of cow pox. The milk is quite good for use, and there is no reason why it should not be utilised. Milk her carefully. Apply after each milking a little boracic or zinc ointment or a little carbolicised vaseline.

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"H. A. J.," Mount Bryan, has yearling filly, stiff and weak in hindquarters, unable to walk backwards, and has gone off her food.

Reply—I suggest that you treat her for worms. Give her half a pint of raw linseed oil and two tablespoonfuls of turpentine. Prepare her by giving only soft food for a day or two before drenching. Give the drench first thing in the morning, on an empty stomach.

"P.M.," Pungonda, asks treatment for mange in dogs.

Reply—Try the following preparation:—Sulphur, $\frac{1}{2}$ lb.; quicklime, 1 lb.; water 1 gall. Simmer over the fire for an hour, or until the mixture becomes golden yellow in color. Allow it to stand over night. Pour off the clear fluid and bottle it for use. Clip off the hair from affected parts and paint with the lotion. Repeat at weekly intervals.

"T. H. H.," Arthurton, asks for report on grubs found in the horn and nose bone of a young wether.

Reply—These larvae are the "bots" of the sheep nasal fly (*Oestrus ovis*). The female fly deposits her eggs near the sheep's nostrils, where the larvae hatch on and enter through the nostrils. They attach themselves in the hollow cavities of the head, most commonly at the base of the horn cores, where they remain for about 10 months, when they are ready to undergo the next change in their life's history. Their expulsion is assisted by the act of sneezing. Outside the body the change into the pupa takes place, the fly emerging a little later, when the female lays her eggs and the same cycle is repeated. If few in number these "bots" cause little disturbance in health. The symptoms are those of irritation of the nasal passages. There is a discharge from the nostrils, the head may be carried low or may be rubbed against fences, &c. Attempts are made to dislodge the parasites by sneezing. If, however, the bots are numerous they may cause difficulty in breathing, loss of condition, and other constitutional symptoms. There is no satisfactory method of treatment. The bots can be removed by trephining the skull. Obviously this method has only a very limited application, but has been adopted in the case of valuable stud animals.

"B. T.," Veitch, reports cow recovered from milk fever, but has not come into milk again. Drinks well, but eats little, and is nearly always lying down. Inquirer asks treatment for milk fever.

Reply—Your cow has mammitis, apparently due to infection during the treatment for milk fever. When inflating the udder for milk fever the teats should be carefully cleansed with warm soapy water. The teat tube should be boiled for five minutes immediately before use. Neglect of these precautions often gives rise to inflammation of the udder. Treat the udder by applying frequent fomena. Strip out the affected quarters several times a day. Gently hand the udder and apply a little camphorated oil. This udder trouble will seriously affect her for milk production. An attack of milk fever (parturient apoplexy), which is not complicated by another disease (mammitis), and which terminates favorably, interferes only temporarily with the milk yield, and the milk is fit for use after the usual period from calving.

"P. G. W.," Elbow Hill, asks:—1. If it would be advisable to breed from a mare ruptured through foaling five years ago. 2. Another mare had foal five months old, and her udder became swollen; one teat finally became blind.

Reply—It would be inadvisable in both cases. 1. In the case of the ruptured mare the risk depends upon the extent of the rupture; but it is probable that either the carrying of the foal during the latter months of pregnancy or the exertion of foaling might seriously affect her. 2. A mare with udder trouble such as you describe is not likely to produce sufficient milk to properly nourish a foal. There is also a probability of recurrence of the old trouble at the next foaling.

"G. H. W.," Tarcowie, asks the analysis of the sweat from the body of a horse.

Reply—This consists of water, 94.38 per cent.; organic matter, .52 per cent.; inorganic, 5.10 per cent. The inorganic salts are principally those of potash and soda, chlorides, some magnesia, a little lime, and a trace of phosphate.

"F. G. R.," Wild Horse Plains, reports 2-year-old colt, small lump under jaw. Side of head is very swollen.

Reply—The swelling is probably due to strangles. Isolate him and water him with a bucket. Watch for abscess formation under the jaw which, as soon as it points, may be opened with a clean, sharp knife; afterwards kept clean and dressed daily with disinfectant solution. Give him soft food mash and green stuff. He will feed better if his feed is placed at a suitable height. Give him a little cooling medicine, such as Epsom salts, 1oz., daily in the drinking water. Simple strangles is largely a matter for good nursing.

"W. H. L.," Aberdeen, has 9-year-old gelding, very stiff after journey of few miles. Examination showed two lumps between navel and sheath. Few days later more lumps were visible.

Reply—The swellings over the body varying in size from a pigeon's to a hen's egg are probably due to urticaria. In this disease the swellings often appear quite suddenly, and are accompanied by dullness and stiffness. I advise that he be put on soft food—mashes, and green stuff—and given 2ozs. Epsom salts and one teaspoonful saltpetre in his feed twice a day for two or three days.

DEPARTMENTAL DOINGS.

AMONG THE AGRICULTURISTS.

The first conference of Murray Lands Branches of the Agricultural Bureau was held at Karoonda on October 5th, and was attended by the Chairman of the Advisory Board (Mr. C. J. Tuckwell), the Superintendent of Experimental Work (Mr. W. J. Spafford), and the Acting Secretary Advisory Board (Mr. H. J. Finnis). The second annual gathering of Eyre Peninsula Branches took place at the Government Experimental Farm, Minnipa, and was attended by the principal officers of the Department of Agriculture, including the Director of Agriculture (Professor A. J. Perkins) and the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.).

During the month the Director of Agriculture visited Summertown, at which place he delivered an address, "Manures and Manuring," and Murray Bridge, in the interests of the newly-formed Herd Testing Society.

The Superintendent of Experimental Work (Mr. W. J. Spafford), in addition to attending the Eyre Peninsula and Murray Lands conferences, visited various experimental plots in the South-East and the Government Experimental Farm, Veitch.

FARM BUILDINGS.

The Field Engineer (Mr. J. Paull) visited and supplied Mr. O. Symon, of Riverton, with plans suggesting the layout of proposed farm buildings. That officer also visited Mypolonga, supplied Mr. T. H. Pickering with advice regarding the erection of a silo; and Balaklava, and supplied plans of a barn, stables, chaffhouse, implement shed, &c., to Mr. R. Harris. Bedford Park Sanatorium was also visited, with the object of supplying help in connection with the erection of 100-ton silo.

HORTICULTURE, ETC.

Mr. G. Quinn (Horticultural Instructor) paid a visit to Payneham, with the object of investigating the ill effects of fumigation on citrus trees at a time when they were suffering from a want of moisture.

DAIRYING, ETC.

The Dairy Expert (Mr. P. H. Suter) visited the Murray Bridge and Wudinna Branches of the Agricultural Bureau, and Mr. H. J. Apps spent some time visiting various factories and dairymen in the Willunga and Kadina districts.

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MANURES IN THEIR RELATION TO PRESENT-DAY SOUTH AUSTRALIAN FARMING.

By ARTHUR J. PERKINS, Director of Agriculture.

INTRODUCTION.

"Manures and Manuring" was a favorite topic with my predecessor, Professor Lowrie, in earlier pioneering days; but it is now many years since this subject has been brought forward officially for discussion by Congress. To-day, it is true, the great majority of farmers are users of manure, and it is possible that some may judge advice on the matter more or less superfluous. Nevertheless, to-day we do not stand where we stood 20 years ago, when with little or no local data, our practice was more or less at the mercy of the experience of other countries. To-day we may claim, I believe, that the position has altered for the better; and whilst I readily admit that we are very far from having exhausted all possible inquiries into the matter, I do believe that we possess to-day a body of reliable data for the guidance of present-day practice. And it is to an examination of some of these data, and a general discussion of their bearing and practical significance that I propose devoting this evening.

LOCAL PROGRESS IN THE USE OF MANURES.

In the first place let us glance at some of the achievements of the past. In general farming practice the use of artificial manures, mainly super-phosphate, did not tend to become common until towards 1897, when the total amount of manures used in the State did not exceed 2,000 tons, and when the total area dressed with manure was estimated at 60,000 acres. In Table I. below will be found summarised what progress has been effected in this direction over the past 22 years.

TABLE I.—*Showing Progress in Use of Artificial Manures (chiefly Super-phosphate) in South Australia, 1897-1919.*

Years.	Total Manure Used. Tons.	Total Area Dressed with Manures. Acres.	Total Area under Crops. Acres.	Percentage of Area under Crops. Per cent.	Mean Dressings per Acre. Lbs.	Retail Price of Super- phosphate £ s. d.
1897	2,000	60,000	2,096,638	2.9	75	—
1902	37,500	988,238	2,224,593	44.4	85	—
1907	60,000	1,555,153	2,265,917	68.7	86	4 0 0
1912	91,607	2,583,133	3,062,998	84.5	79	4 2 6
1913	97,023	2,659,608	3,169,559	83.9	82	4 5 0
1914	97,421	2,789,179	3,282,364	85.0	78	4 5 0
1915	98,258	3,040,273	3,763,570	80.8	72	4 7 6
1916	96,893	2,866,787	3,627,477	78.8	76	4 13 6
1917	90,795	2,541,726	3,079,778	82.5	80	5 0 0
1918	90,302	2,571,972	3,110,706	82.7	79	5 5 0
1919	—	—	—	—	—	5 15 0

There are several points of interest in this table, to which your attention should be drawn. In the first place, it may be noted that whereas in 1897

we dressed 60,000 acres with 2,000 tons of manure, 18 years later, in 1915 we were dressing over 3,000,000 acres with close on 100,000 tons of manure. Since then both areas manured and amount of manure used have somewhat fallen away in sympathy with our decreasing areas under crop. It is to be hoped that this perhaps unavoidable falling away from grace—one of the natural consequences of the great war—is now gradually being remedied. Again, whilst in 1897 the area dressed with manures was not 3 per cent. of the total area at the time under crop, to-day it is close on 83 per cent. of that area. These facts serve to show how strong is the hold of artificial manures on farmers, and in how brief a space of time was an important revolution in farming practice successfully brought about.

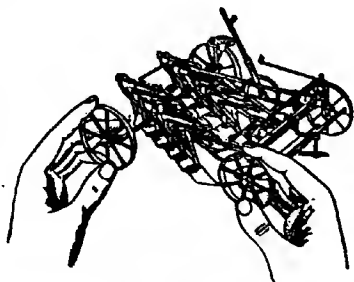
When, however, we turn to the mean quantity of manure used per acre, we find practically no difference between the practice of 1897 and that of 1920; we still use in the neighborhood of $\frac{1}{2}$ cwt. of superphosphate to the acre. I do not wish to condemn this stationary position unreasonably; it is only a foolish man who uses more manure than he can see returns for, and if our farm returns cannot be profitably increased by dressings of manure in excess of $\frac{1}{2}$ cwt. per acre, then the advocacy of heavier dressings is mere waste of time. I propose, however, reverting to this aspect of the question shortly.

Finally, we shall notice an increase of 30s. per ton in the price of standard superphosphate since pre-war days. This represents an advance of 35½ per cent. on pre-war values, and, on the whole, compares favorably with advances in other commodities that we know of and deplore.

LOCAL PREPONDERANCE OF SUPERPHOSPHATES.

Probably more than 99 per cent. of the artificial manures used by South Australian farmers is superphosphate, and I propose, therefore, dealing firstly and mainly with this type of manure.

Numerous analytical data have made us aware that the great bulk of our soils—as is indeed the case of the great bulk of the soils of the world—are relatively deficient in easily soluble, and, therefore, readily available phosphoric acid. We know, too, that most of South Australia's good arable land is adequately supplied with lime—indeed, apart from other considerations—the sturdiness and good health of our average livestock bear eloquent testimony in that direction. Now the inference that it is customary to draw from these two facts is that crops grown on such land are likely to benefit from dressings of superphosphate. And the figures that I have given you indicate clearly that farmers have confirmed these theoretical views by their every day practice. There are, of course, some notable exceptions. Fertile volcanic land in the South-East, already rich in phosphoric acid, hardly responds at all to phosphatic dressings; whilst in some other portions of the State, lime deficiency of the soil renders the constant use of superphosphate a very doubtful proposition.



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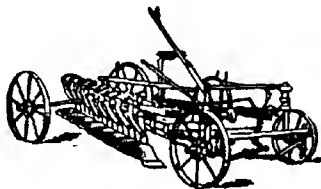
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NORTH TERRACE, ADELAIDE.

Now, it is one thing to have shown that our soils respond generally to dressings of superphosphate, but quite another to determine in what proportions these manures can be applied to our crops to best advantage. We have already seen that for the State as a whole the mean dressing in current use is about $\frac{1}{2}$ cwt. per acre. Do we stand to gain by increasing this dressing? That is the question which I now propose examining.

ON THE WISDOM OF INCREASING OUR MEAN DRESSINGS OF SUPERPHOSPHATE.

Although, as we shall have occasion to see later on, there are certain indirect benefits which attach to the use of heavier phosphatic dressings, on the whole, it may be admitted that their general adoption is mainly dependent upon two factors only, namely, (1) their ability to ensure consistently higher crop yields; and (2) the fact that the value of these increased yields is appreciably in excess of the cost of the extra manure. Formerly, on this question we were compelled to work more or less in the dark, and any expression of general policy was usually weakened by unavoidable mental reservations. Fortunately, to-day, we have definite records, extending over a reasonably adequate period of time and embracing most of the conditions met with in our wheat-growing areas. First and foremost we have the records of the Roseworthy Agricultural College Farm, extending back now to 16 years; next we have the records of the Government Experimental Farms in various parts of the State; and finally, those of special plots placed on private farms but worked under direct departmental supervision. These various data have been summarised below in Table II.

TABLE II.—*Showing Mean Influence on Varying Dressings of Superphosphate in South Australia.*

	Number of Years Concerned.	No Manure.	36/38 Superphosphate per Acre.			
			$\frac{1}{2}$ cwt. Bush.	1 cwt. Bush.	2 cwt. Bush.	3 cwt. Bush.
Roseworthy.....	14	15.85	18.50	19.50	20.47	20.63
Booborowie	4	25.63	28.92	32.67	34.55	34.77
Turretfield	4	15.43	17.33	17.67	17.87	16.92
Veitoh	5	12.21	14.05	15.10	14.56	15.65
Minnipa	3	8.80	14.59	15.77	17.34	18.29
Butler	4	11.02	15.55	17.37	21.98	24.05
Wilkawatt	4	5.95	6.93	8.22	10.32	10.32
Means for the State.	—	13.56	16.55	18.04	19.58	20.09
Mean increases for the State	—	—	3	$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{1}{2}$

I do not wish to insist that the data summarised in Table II. are altogether beyond reproach; indeed, I recognise readily that the possibly modifying influence of a few additional seasons can but add to their value and authority. In the meanwhile, however, these data are the best that are available to us; and, in my opinion, they can be legitimately used in discussions affecting mean dressings of superphosphates in this State.

Before dealing with the general question that more immediately concerns us to-day, I shall observe that in all the districts concerned the influence of $\frac{1}{2}$ cwt. of superphosphate has been uniformly satisfactory, leading to increases varying from 12.8 per cent. at Booborowie to 65.9 per cent. at Minnipa. The effectiveness of the second $\frac{1}{2}$ cwt., however, in keeping with the law of diminishing returns, was less pronounced. This fact was even more marked with the second hundredweight, which lost all value at Veitch. Finally, the third hundredweight was appreciably effective in Butler only.

We are, however, less concerned with particular districts to-day than with the State as a whole; and it is to the mean results for the State that I wish mainly to draw your attention. These results are, I believe, very striking, and of a nature to lead us to believe that it might be to our advantage to use heavier dressings of superphosphate than has hitherto been our wont.

Briefly, the first $\frac{1}{2}$ cwt. has been responsible for a mean increase of 3 hush., or 22.1 per cent.; the second $\frac{1}{2}$ cwt. for an increase of $1\frac{1}{2}$ bush.; or 9 per cent. In combination, therefore, the first hundredweight was responsible for an increase of $4\frac{1}{2}$ hush., or 33 per cent. above unmanured crops.

The second hundredweight, on the other hand, led to an increase of $1\frac{1}{2}$ hush., or 8.5 per cent. above crops treated with 1 cwt. only.

Finally, the increase attributable to the use of the third hundredweight was $\frac{1}{2}$ bush. only, or 2.6 per cent. above crops dressed with 2 cwt. of superphosphate.

Are all or any of these increases profit-bearing? In other words, are the commercial values of these increases appreciably and consistently higher than the cost of the manure used to secure them? Unfortunately, the prices of both grain and manure are apt to fluctuate, and not always, although perhaps generally, in sympathy one with the other. It appears to me, therefore, that in this connection we must be guided very largely by market prospects. I have endeavored to summarise in Table III. the general position relatively to prices usually prevailing.

TABLE III.—*Showing Values of Increases Due to Dressings of Superphosphate according to Prices of Wheat.*

Wheat Prices per Bush.	Increase from $\frac{1}{2}$ cwt. Above No Manure. 3 bush.	Increase from 1 cwt. Above $\frac{1}{2}$ cwt. $1\frac{1}{2}$ bush.	Increase from 2 cwts. Above 1 cwt. $1\frac{1}{2}$ bush.	Increase from 3 cwts. Above 2 cwts. $\frac{1}{2}$ bush.	Calculated Increase from $\frac{1}{2}$ cwt. Above No Manure. $3\frac{1}{2}$ bush.
Value of Increases at Varying Prices of Wheat.					
3/6	10/6	5/3	5/3	1/9	13/1
4/-	12/-	6/-	6/-	2/-	15/-
5/-	15/-	7/6	7/6	2/6	18/9
6/-	18/-	9/-	9/-	3/-	22/6
7/-	21/-	10/6	10/6	3/6	26/3
8/-	24/-	12/-	12/-	4/-	30/-
9/-	27/-	13/6	13/6	4/6	33/9
10/-	30/-	15/-	15/-	5/-	37/6
Cost of Extra Manure at Current Mean Rates.					
—	3/1	3/1	6/2	6/2	4/7

A glance at Table III. will show that the increase from the use of $\frac{1}{2}$ cwt. of superphosphate is profit-bearing with wheat even at 3s. 6d. and superphosphate at its present current price, 6s. 2d. per cwt. (this price includes 100 miles railage, but not cartage to the farm). The same may be said of the increase arising from the use of an additional $\frac{1}{2}$ cwt. On the other hand, the $1\frac{1}{2}$ bush. increase secured from the use of a second hundredweight of superphosphate is not profit-bearing at present prices of manure, except for wheat at 5s. a bushel and over. Finally, the increase from the use of a third hundredweight is not profit-bearing even with wheat at 10s. a bushel. For purposes of comparison, I have indicated in the last column of the table the value of the calculated increase attributable to the use of $\frac{3}{4}$ cwt. of superphosphate, which has already been shown to be the mean dressing in current use in this State.

I am of the opinion that a careful consideration of these data leads to the conclusion that farmers in this State would, in present conditions of the market, be amply justified in increasing their mean dressings of superphosphate. I shall add that to use less than 1cwt. of superphosphate to the acre seems equivalent to throwing money away; and that in present circumstances it is probable that our mean dressings should be nearer to 2cwt. than to 1cwt.

ON THE INDIRECT BENEFITS OF HEAVIER DRESSINGS.

I have already hinted that besides the direct benefits, represented in profitable increased crop-yields, there are, in addition, indirect ones which can be claimed for the consistent use of relatively heavy dressings of phosphatic manures. I had in view, of course, the enhanced value of the grazing when, as must occur from time to time, arable fields are thrown out of crop and grazed. This is a question to which I have repeatedly drawn attention in the past, particularly in connection with my Roseworthy experiences; to-day, neither time nor subject-matter permit of more than a casual glance at it. Briefly, all of us are, or at all events all farmers, should be interested financially quite as much in livestock operations as in the growing of crops. Moreover, the world's best practice shows that these two main lines in the farmer's business can be so handled as mutually to support one another; and in the end high crop returns are frequently contingent on successful livestock operations, and *vice versa*. Further, general local experience, extending now well over 20 years, proves very definitely that adequate phosphatic dressings of wheat crops lead not only to improved crop returns but later on, and in the course of time, to very marked improvement in the grazing value of depastured fields. This improvement, however, the result of the residual effect of the manure, is a gradual process, and can be hastened only by what I call adequate dressings. Personally, I have long been convinced that 2cwt. dressings are far more effective in this direction than the lighter ones in current use; and I shall say that if the crop increase does no more than recoup to the farmer the outlay involved in the use of an additional

hundredweight of superphosphate, then, from the point of view of the success of livestock operations, 2cwt. dressings are amply justified, and reciprocally heavier grazing means more abundant animal droppings and corresponding enhancement of soil fertility and power to command high crop yields.

HEAVY PHOSPHATIC DRESSINGS DO NOT LEAD TO BLIGHTING OFF.

But, in my earlier Roseworthy days, I used constantly to be told that heavy dressings which were successful in that locality would be fatal in others, and particularly in the lighter types of soil so common in the mallee. The crops, it was asserted, would, under their influence, be blighted off with the first approach of summer weather. It seems to me that this opinion is founded upon a wrong conception of things. It appears to be assumed that because rankly grown, soft sappy crop growth is liable to blighting off under special weather conditions, therefore crops stimulated by adequate phosphatic dressings are likely to suffer in like manner. It is overlooked, however, that phosphatic dressings are not responsible for this rankness and flabbiness of growth, but rather the high condition of the soil, a temporary exaggeration in its available nitrogen contents, and particularly moist mild winter conditions which inevitably foster this condition of growth. If anything, phosphatic dressings strengthen growth and encourage grain formation rather than culm development. Moreover, for these views I am not dependent to-day on Roseworthy experience alone. We have within recent years established superphosphate plots in many other portions of the State; and I am able to assert that relatively heavy dressings are proportionately more effective in the lighter types of soils than in the heavier ones, providing always that the former are adequately stocked with lime.

PHOSPHATIC DRESSINGS OF SOILS DEFICIENT IN LIME.

I have already indicated that poverty in lime in a soil is a hindrance to the effective use of superphosphate as a suitable phosphatic dressing; and unquestionably we have many soils that are so situated, and that must nevertheless remain more or less infertile and unsatisfactory unless adequately stimulated with phosphates. How can this difficulty be overcome? Perhaps in this connection we should first realise why superphosphate is essentially unsuited to soils lacking lime. It is, as you all know, a highly acid substance; its corrosive action on the bags which hold it is well known to you. In fact, a farmer, suspicious of the integrity of others, once wrote to me to the effect that he was certain the manure supplied him was inferior since it did not corrode the bags as it should. Well, as you may imagine, this highly acid substance is not, in its natural state, the safest material to bring in direct contact with the tender rootlets of germinating seeds. Indeed, of the evil effects of this we have a good example in what happens when you mix seed, such as rape or sorghum, with superphosphate and sow the mixture under dry conditions of soil. What is the usual consequence? Little or no growth shows above ground; the moisture of the manure is sufficient to start the

germination process in the seed, but the rootlets and germinal shoots wither away as soon as they come in contact with the corrosive acid medium. How is it, then, that no ill effects follow the ordinary application of superphosphate to a wheat crop? Simply because in the moist soil with which this acid material is brought in contact are special soil ingredients which neutralise it and cause it to revert and lose its corrosive qualities; and the chief of these ingredients is lime. Associated with this change is a slight loss of water solubility, which does not, however, impair to any appreciable degree the availability of the superphosphate as plant food. Hence, although in time superphosphate will revert under the influence of soil materials other than lime, the process is slower, and germinating plants are always liable to suffer. Moreover, very frequently the reaction of soils deficient in lime is itself distinctly acid, much to the detriment of healthy plant growth; and repeated dressings of an acid manure like superphosphate can serve only to aggravate the trouble.

It will probably be clear now that superphosphate is not the type of manure that can be recommended for soils deficient in lime, unless indeed these soils have themselves been heavily dressed with lime at an earlier date. Failing this, we must fall back on the less soluble, but neutral, or slightly alkaline phosphates such as basic slag, or even crushed untreated rock, reduced to a requisite degree of fineness. Numerous deposits of relatively low grade phosphates are known to exist in this State, and I believe they could be profitably exploited if they were placed on the market in a very fine state of division and sold at reasonably low rates. Finely ground natural calcium phosphate would be invaluable throughout the South-East of this State, both for arable and pasture lands; and the same may be said of much of our hills, Kangaroo Island, and any part of the State in which sorrel is known to flourish.

SUMMER DRILLING OF SUPERPHOSPHATE.

Most of us drill in our phosphatic dressings at seed-time with the seed, and no doubt, in ordinary circumstances, and when relatively small areas are being handled, it is the best and cheapest process to follow. When several hundreds of acres are concerned, however, I am strongly of the opinion that if we wish to make the most of our very limited good seeding period, the superphosphate should be drilled in at our leisure in February and March independently of seeding operations. We can then afford to sit down and wait for good seeding weather, and when ultimately it comes the area sown in a day would be limited only by the areas we are able to cover with harrows and cultivators following behind a broadcaster. I have seen this practice successfully adopted year after year by one of the best haygrowers of the Roseworthy district, and to those who have large areas to seed and who wish to take advantage of good seeding weather, I unhesitatingly recommend it. Theoretically there are no objections to the practice. The superphosphate will revert slowly in contact with the moist earth; it will not leach out

of the soil however heavy the rains that follow, and the roots of plants will avail themselves of it quite as readily as if it had been drilled in simultaneously with the seed.

THE MONEY VALUE OF SUPERPHOSPHATES TO THE STATE.

Before leaving the question of phosphatic manures I shall endeavor to give a concrete illustration of what these manures have meant to farmers and ultimately to the State during recent times. Since 1897 we have used in this State about 1,369,500 tons of manure. If we admit my figures to be approximately correct, namely, that a $\frac{3}{4}$ cwt. dressing has in the past been responsible for a mean increase in crop of $3\frac{1}{2}$ bush., then at an average price of 4s. a bushel, this manure has been worth to the State between 25 and 26 millions sterling. On the other hand, at present prices the annual value of the crop increase, due to the action of these manures, is probably not less than three and a half millions sterling.

(To be continued.)

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VEITCH'S WELL EXPERIMENTAL FARM.

[By W. J. SPAFFORD, Superintendent Experimental Work, and
L. SMITH, Manager.]

This farm is situated in the hundred of Allen, 158 miles from Adelaide, on the Loxton Railway. It contains about 3,800 acres of land, the bulk of which is sandy, the remainder running to shallow light-loam soils overlying hard limestone rock—conditions similar to thousands of acres of surrounding country.

THE SEASON, 1919.

The total rainfall received this year—13.24in.—was about the average for the farm, but of this total, 5½in. fell in February and over 2in. in December, and only 5.16in. were recorded during the cropping season—April to November. Even though the “useful” rain was so little, a better distribution of it would possibly have given more chance of grain crops. The monthly falls, with yearly totals and means for the period 1909-1919, are arranged below:—

Rainfall Distribution—Veitch's Well, 1909-1919.

	Means, 1909-1913.	1914.	1915.	1916.	1917.	1918.	1919.	Means, 1909-1919
	In.	In.	In.	In.	In.	In.	In.	In.
January	0.34	0.31	0.43	0.18	0.45	0.07	0.20	0.31
February	1.31	0.56	—	0.03	2.60	0.23	5.49	1.41
March	2.07	1.06	—	0.10	0.78	0.49	0.56	1.13
April	0.10	1.01	0.51	0.20	0.24	1.00	0.26	0.34
May	1.68	0.52	1.33	0.43	1.15	1.31	1.88	1.31
June	1.88	0.35	1.91	1.97	1.01	1.08	0.37	1.47
July	1.17	0.38	0.63	2.43	1.14	1.39	0.29	1.10
August	1.08	—	1.67	4.01	1.91	2.36	0.53	1.44
September	2.16	0.15	1.99	2.57	2.01	0.22	0.76	1.68
October	0.79	0.15	0.56	1.64	2.38	0.98	0.45	0.92
November	1.05	1.10	0.19	2.04	1.72	0.07	0.62	1.00
December	0.72	0.65	0.56	1.09	1.21	—	2.03	0.83
Total	14.36	6.24	9.83	16.69	16.60	9.20	13.24	12.94
“Useful” rain (April-November) ..	9.91	3.66	8.79	15.29	11.56	8.41	5.16	9.26

The next table shows the distribution of the “useful” rainfall, and it is quite plain in that table that, although the seeding rains were good for the district, the falls from then onwards were much too light.

Distribution of "Useful" Rainfall in 1919, comparatively with the Means, 1909-1919.

	1919. In.	Means. 1909-1919. In.
Seeding rains (April-May)	2.14	1.65
Winter rains (June-July)	0.66	2.57
Spring rains (August-October)	1.74	4.04
Early summer rains (November)	0.62	1.00
Total "useful" rainfall	5.16	9.26

CROPS.

No crops other than cereals were grown in the fields, and it must a long time before other kinds of crops are grown on large areas in these conditions.

Hay Crops.—Only one block of land—in Field 5—was sown solely for hay. This block was ploughed in August, 1918, kept cultivated during the year, and was drilled in with Baroota Wonder wheat at the rate of 60lbs. seed with 1cwt. superphosphate to the acre, commencing on April 22nd. From this field 66.76 acres out of a total 109.88 acres were cut, the remainder being secured from headlands grain crops in Fields 2 and 3. All told only 45 tons of hay were cured this season, which quantity means an average yield of only 8wts. 21lbs. per acre, and brings the mean yield of hay for the farm down to 17cwts. 8lbs. per acre, as is to be seen in the next table:—

Hay Returns—Veitch's Well, 1910-1919.

Year.	Total "Useful"		Area. Acres.	Total Yield.			Yield per Acre.		
	Rainfall. In.	Rainfall. In.		T.	C.	L.	T.	C.	L.
1910	16.19	10.15	82.00	82	0	0	1	0	0
1911	13.36	7.28	121.50	74	18	0	0	12	37
1912	11.57	10.19	218.00	109	0	0	0	10	0
1913	14.95	8.27	140.00	70	0	0	0	10	0
1914	6.24	3.66	100.00	Total failure.					
1915	9.83	8.79	158.00	180	0	0	1	2	88
1916	16.69	15.29	127.08	243	0	0	1	18	27
1917	16.60	11.56	69.01	110	0	0	1	11	98
1918	9.20	8.41	78.89	93	16	0	1	3	87
1919	13.24	5.16	109.88	45	0	0	0	8	21
Means	12.79	8.98	—	—	—	—	0	17	81

This low yield of 8cwts. 21lbs. of hay per acre is the poorest received at this farm, with the exception of 1914, when the crop failed; but, again excluding 1914, the "useful" rainfall received was lower than in any previous year since the commencement of the farm.

Oat Crops.—Only about 50 acres were seeded with oats this year, composed of four varieties, and all in Field 5. The land was ploughed in August, 1918, kept worked as bare fallow throughout the season, and seeded with the varieties at the rate of 60lbs. seed with 1cwt.

superphosphate to the acre, towards the end of April. The yields secured are set out in the following table:—

Oat Variety Yields—Veitch's Well, 1919.

Variety.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Algerian	7.13	112 34	15 33
Calcutta	6.72	102 5	15 8
Scotch Grey	13.61	104 36	7 28
Sunrise	11.71	59 17	5 3
Farm average	39.17	379 12	9 27

The yields secured are very low for oats, particularly when grown on fallowed land; but so was the "useful" rainfall, and it is rather remarkable that so much grain was formed and matured.

The average for the farm, which is set out in detail in the table below, was brought down to 20bush. 24lbs. per acre, which is quite a satisfactory average yield per acre for oats in such conditions, if it can be maintained over a long period of seasons.

Oat Returns—Veitch's Well, 1916-1919.

Year.	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre Bush. lbs.
1916	16.69	15.29	12.39	478 37	38 25
1917	16.60	11.56	50.19	1,396 35	27 33
1918	9.20	8.41	40.43	253 24	6 11
1919	13.24	5.16	39.17	379 12	9 27
Means	13.93	10.10	—	—	20 24

Since oats have been grown at the farm—1916—the varieties tried have behaved as follows:—

Yields of Varieties of Oats—Veitch's Well, 1916-1919.

Variety.	1916. Bush. lbs.	1917. Bush. lbs.	1918. Bush. lbs.	1919. Bush. lbs.	Mean 1917-19 Bush. lbs.
Algerian	38 26	28 9	7 12	15 33	17 3
Calcutta	—	27 2	7 12	15 8	16 5
Scotch Grey	—	27 35	4 36	7 28	13 8
Sunrise	—	—	5 16	5 3	—
Farm average	38 26	27 33	6 11	9 27	14 9
	In.	In.	In.	In.	In.
Total rainfall	16.69	16.60	9.20	13.24	13.01
"Useful" rainfall	15.29	11.56	8.41	5.16	8.33

Barley Crops.—The varieties of six-rowed barleys grown this year were all sown in a block of land on the west side of Field 2, which was ploughed between September 9th and September 23rd, cultivated in October, March, and April, drilled between May 16th and May 21st at

at rate of 50lbs. seed with 1cwt. superphosphate to the acre, and immediately harrowed. The yields of the barleys are set out below:—

Barley Variety Yields—Veitch's Well, 1919.

Variety.	Area. Acres.	Total Yield.		Yield per Acre.	
		Bush. lbs.		Bush. lbs.	
Tunis, 1	18.24	72	34	3	49
Tunis, 4B	15.03	44	30	2	48
Short Head	15.94	38	5	2	20
Tunis, 4	15.79	14	23	0	45
Tunis, 5	18.18	16	4	0	44
Farm average	83.18	185	46	2	12

These yields are extremely low, and were very disappointing, because, despite the small amount of rain received after seeding—less than 4in. for the growing period—the crops looked fairly promising, but did not develop grain. It was our intention to work up some stubble and for barley, but the growth of weeds on the fallowed land, following the heavy February rains, kept all teams busy, and when horses were free for breaking stubble fields the soil was too dry, and the rains were too light to admit of the work being done in time. This was rather fortunate as things turned out, because, judging by the results from late-sown fallow, it would have meant the waste of seed.

As is shown in the next table, this low yield of 2bush. 12lbs. has brought the mean yield for the crop down to 14bush. 1lb. per acre:—

Barley Returns—Veitch's Well, 1915-1919.

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.
	In.	In.		Bush. lbs.	Bush. lbs.	
1915	9.83	8.79	22.72	248	9	10 46
1916	16.69	15.29	20.10	517	20	25 37
1917	16.60	11.56	44.03	1,104	10	25 4
1918	9.20	8.41	49.68	305	5	6 7
1919	13.24	5.16	83.18	185	46	2 12
Means	13.11	9.84	—	—	—	14 1

Rye Crops.—A small area of rye was again grown this year, but only returned the seed sown. This crop has been tried for the past four seasons, but has only averaged 6bush. 14lbs. per acre, as is to be seen below:—

Rye Returns—Veitch's Well, 1916-1919.

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.
	In.	In.		Bush. lbs.	Bush. lbs.	
1916	16.69	15.29	0.36	3	12	8 53
1917	16.60	11.56	5.98	71	16	11 55
1918	9.20	8.41	5.00	15	40	3 8
1919	13.24	5.16	2.75	2	50	1 2
Means	13.93	10.10	—	—	—	6 14

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AND ASSISTANCE AND SUPERVISION

IN CONSTRUCTION,

ON APPLICATION TO THE

DEPARTMENT OF AGRICULTURE

ADELAIDE.

Wheat Crops.—All varieties of wheat were grown on fallowed land—Fields 2, 3, and 5.

Field 2 (east end) was ploughed between August 28th and September 7th, was cultivated in October, March, and April, and between May 10th and May 15th was drilled in with Gluyas wheat at the rate of 60lbs. seed with 1cwt. superphosphate to the acre, and Baroota Wonder wheat in experimental plots, and the whole block was immediately harrowed.

Field 3 was ploughed between July 8th and July 29th, cultivated in September, October, February, and March, seeded with a number of varieties at the rate of 60lbs. seed with 1cwt. superphosphate per acre between May 5th and May 10th, and immediately harrowed.

Field 5 was ploughed between August 1st and August 26th, cultivated in September, March, and April, had varieties drilled in at the rate of 60lbs. seed with 1cwt. superphosphate per acre between April 2nd and May 25th, and was immediately harrowed.

The yields secured from these varieties together with the farm average for the season are set out in the next table:—

Wheat Variety Yields—Veitch's Well, 1919.

Variety.	Field Grown. No.	Area, Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Silver Baart	3	6.82	63 50	9 22
Fortune	3	3.55	32 18	9 6
Bearded Gluyas	3	4.03	35 41	8 51
Cadet	3	1.45	11 48	8 8
Caliph	3	6.74	52 49	7 50
Red Russian	3	17.19	130 36	7 36
Gluyas	2	16.24	109 29	6 44
Walker's Wonder	3	18.72	121 43	6 30
Marshall's No. 3	5	18.98	106 56	5 38
College Eclipse	3	7.51	40 13	5 21
Cumberland	3	8.08	41 43	5 10
Baroota Wonder	3	24.84	117 1	4 43
Federation	5	13.84	64 13	4 38
Queen Fan	5	31.93	147 3	4 36
King's Red	3	10.15	46 18	4 34
Yandilla King	5	43.79	144 40	3 18
Late Gluyas	3	16.39	36 24	2 13
Baroota Wonder	Exp.	13.38	116 47	8 44
Farm average	—	263.63	1,419 32	5 23

As is seen above, the yields varied from 9bush. 22lbs. per acre to 5bush. 13lbs. per acre, with an average of 5bush. 23lbs. per acre, which are very low returns, but nevertheless are quite satisfactory, considering that only 5.16in. of "useful" rain were recorded, and some of the later sown wheats had very little more than 4in. of rain between seeding and ripening. It appears that the yields secured, low as they were, were made possible by the heavy rains in February, some of which

must have been stored in the fallows by the cultivations given soon after the rain fell.

All of the varieties which did comparatively well, except Cadet, are proved hardy, drought-resistant wheats, fairly well known in our low-rainfall districts. Silver Baart is a beardless, white-chaffed, early variety, which makes fair hay crops as well as grain, in limestone conditions. Fortune is a comparatively "new" variety, which originated at Roseworthy Agricultural College, and is a very promising wheat for limestone conditions: beardless and white chaffed. Bearded Gluma is also a Roseworthy College wheat, which has proved very drought-resistant: very early, bearded, and brown chaffed. Cadet is a white-chaffed, beardless wheat, producing grain of really good quality, which originated at Roseworthy Agricultural College. Caliph, another Roseworthy College wheat, becoming very well known in most of our limestone districts, is a very hardy, beardless, white-chaffed variety. Red Russian is a very early, hardy, beardless, white-chaffed, red-grained variety, well and favorably known in our low-rainfall districts. Baroota Wonder is an early, hardy, beardless, white-chaffed wheat, that does consistently well in limestone conditions, being a good hay-yielder as well as grain producer.

The next table gives details of the wheat crops grown at the farm since 1909:—

Wheat Returns, Veitch's Well, 1909-1919.

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre Bush. lbs.
	In.	In.		Bush.	lbs.	
1909	14.45	13.04	22.00	396	0	18 4
1910	16.19	10.15	197.50	2,156	0	10 55
1911	13.36	7.28	620.90	5,080	30	8 11
1912	11.57	10.19	569.00	5,544	18	9 45
1913	14.95	8.27	791.40	4,742	28	6 6
1914	6.24	3.66	951.00	325	30	0 21
1915	9.83	8.79	602.11	6,681	51	11 8
1916	16.69	15.29	407.74	7,102	20	17 25
1917	16.60	11.56	469.91	7,156	50	15 14
1918	9.20	8.41	287.89	1,905	28	6 37
1919	13.24	5.16	263.62	1,419	32	5 25
Means	12.94	9.25	—	—	—	9 54

The figures above show that this season's low yield has brought the mean yield for wheat at the farm, for the period 1909 to 1919, down to 9bush. 54lbs. per acre, and although this yield is not high, it is quite satisfactory for the conditions at Veitch, particularly if it be remembered that a big collection of varieties is grown each year, many of which have proved quite unsuitable for the district.

The next table gives details of how the wheats grown this year have fared in previous seasons at the farm:—

Yields of Varieties of Wheats, Veitch's Well, 1910-1919.

Variety.	Means						Means									
	1910-1915.				1916.		1917.		1918.		1919.		1910-19.		1916-19.	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
a Wonder ..	10	29	16	20	17	54	5	30	6	7	10	53	11	28		
la King ...	9	14	21	8	18	2	10	35	3	18	10	51	13	16		
tion	8	4	25	33	19	31	4	9	4	38	10	14	13	28		
rland	8	11	16	26	17	59	8	29	5	10	9	43	12	1		
Early	8	16	16	9	15	14	5	9	4	34	9	4	10	16		
Baart	7	6	14	13	14	31	3	55	9	22	8	28	10	30		
ussian	—	—	13	12	20	24	14	45	7	36	—	—	13	59		
r's Wonder .	—	—	18	41	21	30	8	18	6	30	—	—	13	45		
.	—	—	16	54	17	44	9	53	6	44	—	—	12	49		
e Eclipse ..	—	—	20	18	14	34	9	23	5	21	—	—	12	24		
Fau	—	—	22	56	16	46	2	54	4	26	—	—	11	33		
d Gluyas ..	—	—	13	57	16	35	3	26	8	51	—	—	10	42		
Gluyas	—	—	17	53	18	13	3	40	2	13	—	—	10	30		
all's No. 3 ..	—	—	—	—	23	7	7	40	5	38	—	—	—	—		
le	—	—	—	—	—	—	9	18	9	6	—	—	—	—		
.	—	—	—	—	—	—	9	3	8	8	—	—	—	—		
.	—	—	—	—	—	—	—	—	7	50	—	—	—	—		
n average ..	7	43	17	25	15	14	6	7	5	23	9	6	11	10		
rainfall . . .	12.02in.		16.69in.		16.60in.		9.20in.		13.24in.		12.79in.		13.93in.			
bul' rainfall.	8.06in.		15.29in.		11.56in.		8.41in.		5.16in.		8.88in.		10.10in.			

Of the varieties that have done well over a period of years, and not mentioned above in connection with this year's results, Yandilla King, Derivation, and Gluyas are too well known throughout South Australia to need describing. Walker's Wonder is an early, hardy,ardless brown-chaffed wheat which does well in most of our mallee districts.

EXPERIMENTAL PLOTS.

To date we have not been in a position to conduct permanent experimental plots at this farm, but for the past four years quantitative fertiliser and seed tests have been carried out with wheat. Permanent experimental plots have been grubbed, surveyed, and are now in crop, in the near future we will have proper experimental results with various methods of growing cereals.

Fertiliser Tests.

A block of land in a fallowed field has been selected during each of the past four years, and has been divided into plots, all of which have

received seed wheat at the rate of 60lbs. per acre, but different dressings of superphosphate. In each particular season, the same variety was used on all plots, and the seeding was done at the one time. The results secured from these plots for each year are shown in the next table:—

Quantitative Fertiliser Tests, Veitch's Well, 1915-1919.

(Tests on wheat sown at rate of 60lbs. per acre.)

Fertiliser per Acre.	1915.		1916.		1917.		1918.		1919.		$\frac{1}{2}$ 1920.
	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.
No manure	11	52	13	39	20	47	5	17	9	15	12
$\frac{1}{2}$ cwt. superphosphate . .	13	15	17	7	23	48	6	20	9	28	14
$\frac{1}{2}$ cwt. superphosphate . .	—	—	17	40	23	49	6	24	8	33	14
1 cwt. superphosphate . .	13	43	18	49	25	30	7	28	9	43	14
2 cwt. superphosphate . .	13	40	18	32	21	17	8	22	10	37	14
3 cwt. superphosphate . .	13	19	21	31	25	15	9	9	8	58	14
Farm average	11	6	17	25	15	14	6	37	5	23	11
Total rainfall	9.83in.		16.69in.		16.60in.		9.20in.		13.24in.		13.22
"Useful" rainfall	8.79in.		15.29in.		11.56in.		8.41in.		5.16in.		14

* Four years only.

The mean yields for the period 1915 to 1919, as set out above show:—

1. That an application of superphosphate to wheat at Veitch's Well is profitable.
2. That $\frac{1}{2}$ cwt. superphosphate gives an increase of 1bush. 50lbs. of wheat per acre.
3. That 1 cwt. superphosphate gives an increase of 2bush. 53lbs. of wheat per acre.
4. That the second half of the application where 1 cwt. of superphosphate is used is worth 1bush. 3lbs. of wheat per acre.
5. That the increased wheat yields secured by using dressings of 2cwt. and 3cwt. of superphosphate per acre are not as profitable as those obtained by lighter dressings.
6. That the greatest profit per acre is obtained where 1 cwt. superphosphate is used.

Rate of Seeding Tests.

For the same seasons that fertiliser tests have been conducted, series of plots testing various quantities of seed wheat per acre have been conducted on fallowed land, each plot receiving a dressing of 1 cwt. superphosphate per acre. The same variety of wheat was used on all plots in each particular year, and other than the amount of seed used

on the plots, their treatment was identical. The results obtained during the past four years are set out below:—

Quantitative Seed Tests, Veitch's Well, 1915-1919.

(Tests on wheat sown with lewt. superphosphate per acre.)

Seed per Acre.	1915.		1916.		1917.		1918.		1919.		Means
	Bush. lbs.		Bush. lbs.		Bush. lbs.		Bush. lbs.		Bush. lbs.		1915-19.
30lbs. wheat	9	47	18	9	22	53	7	20	7	21	13 6
45lbs. wheat	10	9	19	1	23	42	8	39	7	20	13 46
60lbs. wheat	10	45	19	5	23	56	8	53	7	51	14 6
80lbs. wheat	9	57	18	39	26	31	8	41	8	34	14 28
Farm average	11	6	17	25	15	14	6	37	5	23	11 9
Total rainfall	9.83in.		16.69in.		16.60in.		9.20in.		13.24in.		13.11in.
'Useful' rainfall	8.79in.		15.29in.		11.56in.		8.41in.		5.16in.		9.84in.

The mean yields secured from these plots show:—

1. That 30lbs. of seed is not enough in this district.
2. That increasing the seed used by 15lbs. (making the seeding 45lbs.) is worth an increase of 40lbs. grain per acre.
3. By making the seeding 60lbs. per acre, the extra 30lbs. of seed gives an increase of 1bush. of grain per acre.
4. That increasing the seeding to 80lbs. per acre is worth nothing over and above a 60lbs. seeding.

A REPUTATION WELL MAINTAINED.



MANUFACTURERS—

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THE CARE OF YOUNG ORCHARDS AND VINEYARDS IN THE RIVER MURRAY DISTRICTS.

[Paper read before the Glossop Branch of the Agricultural Bureau
by C. G. SAVAGE, Manager Government Experiment Orchard,
Berri.]

In placing this paper before you I do so with the hope that the advice given may prove of some service to you who have just taken up irrigation blocks or are about to do so, and intend to grow fruit trees and vines.

CULTIVATION AND IRRIGATION.

The successful establishment of an orchard or vineyard depends a very great deal upon the amount of cultivation one is prepared to give the land, and not only does the amount of cultivation count, but the quality of the work is also a deciding factor.

I have placed cultivation and irrigation together, as they must necessarily go hand in hand. A thoroughly-worked soil retains moisture for a longer period than does a poorly-cultivated one; consequently well-tilled land requires less water than soil that is only worked to a shallow depth.

If one takes notice of the men who are always calling for irrigations, and examines their holdings, one will invariably find that the land is poorly worked. The soil may look well cultivated and free from weeds, but the depth of the work is shallow, and in many cases a "sole" or "hard pan" has formed within a few inches of the surface soil.

THE DANGER OF EXCESS WATER.

Excess of water often spells ruin, and the trouble is not, unfortunately, confined to the defaulter's orchard, but may extend, and often does, to his neighbor's property, even though the next man may be a careful irrigator. The excess moisture follows the natural under-drainage of the soil, dissolving the soluble salts as it passes through the land. When this drainage water meets an obstruction in the form of a hard bar of clay the water is forced to the surface, and is lost from the land by evaporation, while the injurious salts gathered during the passage through the soil are left in the top layers of the land. This is what happens when orchards are affected with "seepage."

Deep cultivation makes for healthier plants, provides a larger feeding area for the roots through a thorough aeration of the soil, also tends to reduce the danger of "seepage" owing to less water being required, due to the land retaining its moisture for a longer period. The prevention of a "hard pan" may be delayed by varying the depth of the ploughing from year to year. Trees and vines in shallow ploughed land are shallow rooted, and consequently suffer more quickly during hot weather than deep-rooted plants on deeply-worked soil. The soil should be ploughed to a depth of from 6in. to 8in. during the winter operations, but it is not advisable to turn the soil over in the summer months.

CULTIVATION.

The soil should be kept well stirred and weed growth destroyed during the summer in order to reduce the loss of moisture by evaporation. The land should be stirred to a depth of 3in. or 4in. during the summer to form an effective dust mulch. When irrigating young trees or vines open out furrows on either side of the rows, fairly close to the young plants, so that the water will wet the soil around the roots. Many trees and vines die (and especially is this true with refills in established plantations) because the water is not brought close enough to the roots. As the plants develop and the root systems spread there is not the same need to have the furrow close to the trees and vines.

As soon as the land is sufficiently dry to work down finely after an irrigation the scarifiers should be set to work to stir up the ground. Aim at getting an even surface, as ridged soil exposes a larger area to the action of the hot rays of the summer sun.

Should rain fall, the land should be cultivated to prevent a crust forming on the surface of the soil. Remember that a compact soil loses water much more rapidly by capillary attraction than does well-cultivated land. Cultivation should be continued up till about April, then any weeds that grow can be ploughed in during the winter and spring operations to form humus.

COVER CROPS.

Newly-worked lands are subject to drift during the summer months, and if ample provision is not made to counteract this danger great damage will be done to the young trees and vines. To lessen the danger some quick-growing crop should be planted in narrow strips along the centres between the rows. For spring sowing maize, sorghums, dhurra, broom, millet, or Sudan grass may be sown. All of these may be used for feeding stock when the danger of drift is past. The lands along the Murray valley are all deficient in humus, and to supply this very necessary constituent crops should be sown between the rows of vines or trees during the early autumn or late summer just prior to the last irrigation. This early planting of the cover crops allows for a large growth of foliage before the cold weather sets in, and the crops are ready for ploughing under by July and August.

Various crops are planted for cover crops, such as wheat, barley, oats, rye, peas, vetches, and beans. The lastnamed three are legumes, and are much more valuable as a manure, as free nitrogen is obtained from the atmosphere by the aid of bacteroids which live upon the roots of leguminous plants. This very valuable fertiliser is placed in the soil when the crop is ploughed under. If cereal crops are sown humus alone is added to the soil, as the only nitrogen placed in land when the crop is ploughed under is that which was taken from the soil during the growth of the crop.

The cover crop should be manured with either bonedust or superphosphate, but preferably both, when being planted. The application of the fertilisers will tend to give a greater growth of foliage in the cover crop, and will enrich the soil, which in turn will be reflected in the yield of fruit. Humus will retain more moisture than either sand or clay; so viewed from this standpoint alone, it is a very desirable constituent of any soil, especially in semi-arid districts.



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TRAINING THE YOUNG TREE.

Deciduous trees when planted should be headed back to within 12in. to 15in. of the soil line. Low-headed trees are desirable in hot climates in order to protect the stems from sun scald, which tends to retard the sap flow and restrict the vigor of the tree. In windy localities the low-headed tree is desirable, as high-headed trees suffer more from strong winds than do low ones. The fruit is gathered more easily, pruning is done with more ease, as also is spraying, with low-headed trees than with high trees.

The peach and nectarine trees are formed with three to four main arms, which when subdivided give six to eight leaders, which form the secondary arms. This number is sufficient, as the fruiting wood of these trees is fairly long and requires much more room than where the fruit is borne on short spurs.

With the apricot a couple more arms may be built in, while with the plum, apple, and pear up to 16 secondary arms are carried.

During the first spring the growth arising from the trees is allowed to develop until it has passed the brittle stage and there is little danger of the shoots being broken off by the wind. The shoots then required for the formation of the tree are selected and those not required cut back; in many instances there is an advantage in leaving a couple of leaves on the shoots to be cut back to aid in shading the stem of the tree.

In most instances one or more shoots will be found to be making more growth than the rest of the shoots on the tree. In these cases the tips of the strong shoots can be nipped out with the finger and thumb. This produces a temporary check to the shoots so treated, which enables the weak shoot to make up some of the leeway. This operation may with advantage be done a second time during the growing period.

With exceptionally strong-growing trees, the branches may be cut back to the height of the desired subdivision, the resulting growths can be used as the foundation of the secondary arms, thus gaining a season in the formation of the tree.

The second winter's pruning will consist in laying the foundation of the secondary arms; this will be accomplished by cutting to side buds where subdivision is necessary or to buds pointing in an outward direction where it is desirable to carry the branch on without subdivision.

Where trees are being blown over by the wind, the bud left at the top of the shoot may point in the direction of the wind. This practice will aid in building up the tree against the wind. Always aim at forming hollow or vase-shaped trees when forming deciduous trees.

THE CITRUS TREE.

The orange and lemon should be given a stem of 18in. to 24in. to assist in holding the growth and fruit off the ground. The growth should be cut back to solid wood when the tree is planted; if left unpruned the sappy growth dies back, and the extra leaf surface loses much moisture by transpiration that would have otherwise been retained by the tree if pruned.

During the first season citrus trees need little pruning, branches coming down to the ground can be shortened in, but not cut right back; the leaves will tend to shade the bark of the stem, which is very liable to sun scald.

Should the stem of citrus trees be exposed to the direct rays of the sun cover them by tying loosely around either straw or hessian. Do not use any close material, or do not bind tightly; the stem requires circulation of air as well as the other parts of the tree, and if bound tightly the bands will injure the expanding tissues as the tree grows.

THE VINE.

During the first season little is to be gained by reducing the summer growth of the vine back to one shoot. The leaves are the food factories, so the larger the leaf surface the larger the root growth. The vines should be pruned to one or two buds when planted, and all growth, with the exception of suckers, encouraged, as the main object is to produce a good root formation the first season.

During the second winter most of the vines should be again reduced to two buds; in exceptional instances, where the vines are very strong, the growth may be taken to the first wire, where they are to be trellised. Pruning the vine back to two buds assures the obtaining of two strong growths, one of which is suppressed as soon as the brittle stage is passed and there is little danger of the second cane being broken off. The single shoot is encouraged to grow up past the height of subdivision where espalier vines are to be formed, and when 3in. or 4in. above the wire the shoot is cut back to the desired height. Two or three shoots arise near the same level; two of these are selected, and are used to form the foundation of the arms. In the case of the cordon vines, the shoot is encouraged to grow on, and at the next winter's pruning is bent over at the desired height and cut back according to the strength of the vine.

When forming young vines do not leave the rods which are to form the first portion of the main arms too long. The disadvantage of this practice is that many of the buds fail to grow, and long blank spaces are left on the arm, from which it is difficult to obtain shoots. This not only makes an ugly vine, but the fruiting wood is also farther away from the centre of the vine, which is always a disadvantage, as the sap has to flow through hard woody arms, having long spaces without growth. Such conditions do not tend to give the most satisfactory results.

When pruning a cane which is to continue the formation of the arm, prune so that the last bud is underneath. Always cut through a bud so that the last internode is dead, and can be used for securing the cane to the wire. If the cane is tied by the internode behind the last bud the growing tissues will be restricted, and in many cases the cane will crack off at the constriction.

The object in leaving the last bud beneath the cane is that the growth arising therefrom grows upward with a gentle curve. The next season this cane can be laid on the wire with little or no bend in the arm. Where the cane is pruned with the last bud above, the shoot

grows straight up, and when it is placed on the wire next winter a bow is formed which must necessarily retard the flow of sap, in addition to forming an ugly vine.

GRAZING OF STOCK IN VINEYARDS AND ORCHARDS.

The practice of grazing stock in vineyards and orchards has little to commend it. True it is that a certain amount of feed is saved, and that is a consideration, especially in areas where chaff is scarce and the price high. When considered from a profit and loss aspect, more is lost than gained by this practice; on young plants great damage is done by the animals biting back and treading down the young growth.

With older trees many of the young fruit shoots are eaten, and with vines many of the desirable rods and spurs are destroyed. This paragraph, of course, refers to the practice of turning stock amongst the vines and trees after the fruit is gathered.

ORCHARD NOTES.

[By C. H. BEAUMONT, Orchard Instructor.]

DISEASES IN JAPANESE PLUMS AND IN CHERRIES.

In many orchards this year the Japanese plums and some cherries have been severely attacked by "shot-hole" fungus (*Clasterosporium carpophilum*); and the trees are so seriously damaged that there will be no fruit. This disease is called in parts of America "leaf blight." There is every possibility of helping the tree to regain its vigor, even at the present late hour, by spraying at once with Bordeaux mixture, after cutting off the dead wood. The treatment, for prevention, is to spray in the autumn, just as the leaves are falling, and especially in the spring, just when the leaves appear, and fortnightly after until the fruit is set or until the weather sets in warm and clear.

ANTHRACNOSE AND OIDIUM IN VINES.

Both of these diseases are giving extra trouble this year, probably on account of the wet winter and continued mild weather. Vines attacked by anthracnose should be sprayed frequently with Bordeaux mixture until the fruit is set, and swabbed in winter, after cleaning off the old bark, with a 10 per cent. solution of sulphuric acid.

For oidium there is nothing better at the present time than spraying with "lime sulphur solution," which can be bought ready for use, using 1½ galls. in 100 galls. of fresh water. The method of making this solution is described in the October issue of the *Journal*.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Thursday, October 7th, there being present Mr. C. J. Tuckwell (Chairman), the Director of Agriculture (Professor Arthur J. Perkins), the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch), Captain S. A. White, and Messrs. T. H. Williams, H. Wicks, A. M. Dawkins, F. Coleman, and H. J. Finnis (Acting Secretary).

SHORT COURSES OF INSTRUCTION FOR FARMERS.

An intimation was received that the Minister of Agriculture had approved of the scheme for a short course of instruction for farmers to be held at Roseworthy College.

AFFORESTATION.

The following resolution was carried at the recent Conference of Southern Branches:—"That this Conference approves of a policy of afforestation for the Southern districts and elsewhere, and urges on the Government the necessity for carrying forward such a policy." The matter was submitted to the Conservator of Forests, who supplied the following report:—"Many of the conditions at present existing are inimical to as vigorous a course as the department desires; as an illustration it may be pointed out that wire netting is not only about four times more costly than under normal conditions, but very hard to get even at that. Expansion in some cases necessitates providing houses for officers, and all house materials are enormously high, some hardly obtainable, while masons are exceedingly independent and very hard to get. Several deaths have unhappily taken off valued officers, and others have been superannuated, the result of which is that the superintending staff is greatly reduced, and there are at present no young trained officers to take their places, but every effort will be made to extend operations directly normal conditions recur." After considerable discussion the Board decided that in its opinion the reasons given were inadequate, and only supplied further evidence of the need for a body to investigate the whole matter.

BOXTHORN.

The Conference of Southern Branches also resolved, "That in the opinion of this Conference so long as the words 'hedge and breakwind' remain in the proclamation declaring boxthorn a noxious weed it will remain inoperative." The Secretary of the Local Government Department reported that action was being taken to enforce the proclamation, and until or unless it was proved in a Court of Law that the weed could not be effectively destroyed under the proclamation as it stood there appeared to be no occasion for reviewing it." A communication was also received from the Millicent Branch dealing with the destruction of boxthorn. It was pointed out by the Branch that in view of the absolute necessity for windbreaks and shelter for the success of the horticultural, dairying, and stockraising pursuits of the drainage areas in the Millicent district the Government should be urged to exempt from destruction all properly controlled African boxthorn

hedges growing on private property within that district. It was decided to transmit the matter to the Minister, intimating that the Board approved of the tenor of the resolution, provided the term "hedge" was carefully defined as to treatment and size.

DESTRUCTION OF STARLINGS.

The Walla Walla Branch of the Agricultural Bureau of New South Wales intimated that they were desirous of learning the best means for the destruction of starlings in their district. The matter was submitted to Captain White, who furnished the Board with a report on this question. The Secretary was instructed to transmit the report to the Walla Walla Branch.

FORESTRY.

The Forestry Committee of the Board made the following statement of its history and proposals:—

"The thirtieth Annual Congress of the Agricultural Bureau carried a resolution, 'That this Congress considers the question of afforestation of national importance.' This resolution was brought under the notice of the Conservator of Forests, and formed the subject matter of a report by that officer.

The Advisory Board subsequently appointed a subcommittee to investigate the question of forestry in South Australia.

This committee consisted of Captain S. A. White, Messrs. G. R. Laffer, F. Coleman, and H. J. Finnis (Secretary). After a preliminary meeting the committee reported to the Advisory Board as follows:—

1. That the general question of afforestation in South Australia is of the utmost economic importance at the present time.
2. That the question naturally divides itself under two headings:—
 - (a) The protection of indigenous forest areas, and the regeneration of same.
 - (b) The planting of timber trees, principally soft woods.

In regard to (a) the committee considered:—(1) That a general survey should be made of all Crown lands known to bear marketable native timbers. (2) That to enable the committee effectively to carry out this survey it was imperative that an expert in forestry should be added to the committee; the name of Mr. H. H. Corbin, B.Sc., being suggested. It was also suggested that Professor Perkins should be added to the committee.

This report met with the approbation of the Advisory Board. It was then submitted to the Honorable the Minister of Agriculture, pointing out that the committee proposed to make a general survey of all Crown lands known to bear marketable native timber, and requesting the Honorable the Minister's approval to the addition of Mr. Corbin to the committee. This was agreed to by the Honorable the Minister.

The Objects of the Committee.

The Advisory Board was, in general terms, strongly impressed with the necessity for taking stock of the timber resources of South Australia. It was not alone in its fear that the present and future timber

requirements of the State might be neglected until such a time as an actual famine forced the matter under notice. Repeated reference to the question of afforestation at Congress and Conferences of the Agricultural Bureau indicated that agriculturists were much impressed with the urgency for action.

The Board felt that it could be of considerable service by suggesting a policy that, having regard to the present financial stringency, might prove both practical and valuable to the State.

Proposed Activities.—Protection of Native Timbers.

The first matter to which the committee directed its attention was the protection of indigenous forest areas and the regeneration of same. The committee regarded this matter of sufficient national importance to warrant a personal inspection of likely areas.

With this object in view it set about making inquiries with respect to areas likely to be worthy of inspection; the conclusion being reached that attention should first be paid to the heavier rainfall areas in the Hills and South districts, the South-East, Kangaroo Island, and the extreme south of Eyre Peninsula, in every one of which districts there are areas of unalienated land calculated to be carrying timber that might with advantage be preserved.

It was the committee's desire to make recommendations to the Government on this matter after having carefully investigated the whole question. For such an investigation, it is suggested, the committee was peculiarly fitted, having in view the fact that it included in its personnel, among others, a trained forester, an expert agriculturist, and an experienced farmer.

At an early date in the history of the committee the Advisory Board referred to it the various resolutions from the River Murray Conference and Branches of the Agricultural Bureau, urging that steps should be taken to preserve timber growing on the bends of the River Murray. Recognising the importance of the matter, and the fact that delayed action would eventually defeat the object in view, the committee sought to make a personal inspection of the area concerned.

Cultivation of Softwoods Timbers.

Whilst prosecuting its inquiries with respect to the protection of native timbers, the committee proposed to note any areas which it considered suitable for the cultivation of softwood timbers. It was felt that the committee, numbering amongst its members officers trained from the point of view of forestry as well as agriculture, was in a position to weigh the possibilities of the country inspected with due regard to both its agricultural and forestry value.

Utilisation of Native Timbers.

It was proposed to collect evidence with respect to the purpose for which South Australian grown timber could be utilised, particularly with the idea of making available information on this subject, and also with the object of providing some guide to prospective planters. The intention of the committee was to secure statements from and examine local users of timber. The first person examined in this connection was Mr. Moore, manager of the South Australian Brush Company.

The committee's one object is to do a useful service in the interests of the State. It recognises the vital importance of economically exploiting the State's timber resources, and feels that it can, as the result of its proposed investigations, make suggestions that will be of value."

After deliberation it was resolved—"That the Chairman of the Advisory Board and the Chairman of the Afforestation Subcommittee and the Acting Secretary of the Advisory Board interview the Minister to discuss the suggested visit of the subcommittee to the River Murray areas." Capt. White moved and Professor Perkins seconded—"That the report should be sent on to the Minister with a request that it should be placed before Cabinet."

FREIGHT ON FENCING MATERIAL.

In reply to the request of the Conference of Pinnaroo Line Branches that the Government should reduce the freight on fencing materials to the same rate as was charged for firewood, the Railways Commissioner reported that in view of the increased cost of working he was unable to allow any reduction on the existing tariff rates for the carriage of fencing posts, the rate already being a very low one.

EXPERIMENTAL PLOT FOR RETURNED SOLDIERS.

The Kalangadoo Branch asked that a portion of block 429 of the Koorine Estate should be reserved for an experimental plot for the benefit of returned soldiers and new settlers coming into their district. The Commissioner of Crown Lands, to whom this matter was referred for consideration, reported that the property was very heavily improved, and the area that had been reserved to be allotted with the homestead was considered the minimum quantity of land necessary to make the property a paying proposition, so that the proposal could not be sanctioned. The Secretary was instructed to communicate with the Branch in terms of the above reply.

RESOLUTIONS CARRIED AT THE THIRTY-FIRST ANNUAL CONGRESS.

The Board decided to forward the following resolutions of Congress to the Minister of Agriculture:—

(a) "That in the opinion of this Congress the time has arrived for a referendum of the farmers of South Australia on the introduction of bulk handling of grain in South Australia."

(b) "That in the event of the continuation of a compulsory Wheat Pool in this State it is desirable that the farmers be paid the world parity for the whole crop, whether exported or used for local consumption."

(c) "That this Congress urges the Government to consider the question of running a State-owned steamship between Adelaide and the Gulf ports."

(d) "That this Congress is of the opinion that arrangements should be made to permit of the through booking of all goods between stations on the mainland and those on Eyre Peninsula."

(e) "That the attention of the Government be directed to the urgent need for allotting swamp land for the settlement of returned soldiers."

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(f) "That the Government establish an experimental farm on a reclaimed swamp area of the Murray."

RESOLUTIONS FORWARDED TO THE MINISTER OF AGRICULTURE WITH THE SUPPORT OF THE BOARD.

(a) "That the Government be asked to find suitable paddocking for young stock from the Government reclaimed swamp areas from the age of six months to two years, and that the cost of paddocking be at a given rate per week."

(b) "That it is expedient that galvanized iron for water catchment purposes be supplied by the Government to settlers in dry areas on the same terms as the Government now supplies fencing material."

(c) "That the attention of the Government be directed to the high cost of fencing materials." It was decided to ask the Minister to transmit this resolution to the Commonwealth Government.

PLANTING SOFT WOOD TIMBERS.

At the recent Conference of Hills Branches the following resolution was carried:—"That this Conference is of the opinion that it is desirable in every way to further the planting, both by Government and private individuals, of soft wood timber in this State." It was decided to submit this resolution to the Minister with the strong recommendation of the Board.

RESOLUTIONS FROM CONFERENCE OF MURRAY LANDS BRANCHES.

(a) "That we ask for a veterinary surgeon to be stationed in this district and that a fee be charged for his services." It was decided to transmit this matter to the Minister with the recommendation of the Board. (b) "That it be a recommendation from this Conference that the Chief Inspector of Stock be instructed to investigate all deaths of stock reported from other than natural causes." It was decided to submit this matter to the Minister with a request that a report might be secured from the Chief Inspector of Stock. (c) That this Conference considers that when a genuine applicant can be obtained, vacant blocks should be allotted at a fair valuation, cutting the loss on improvements where necessary. The Secretary was instructed to refer the matter to the Land Board for an expression of opinion. (d) "That the Government be asked to provide roads for the settlers in the mallee lands districts." It was decided to forward the matter to the Minister. (e) "That the Government be urged to have taught in our public schools, among our children, a desire for things Australian and to think Australian." The resolution was received. (f) "That in fencing joint boundaries of vacant blocks, the Crown be placed in the same position as an ordinary lessee. The Board decided to forward the matter to the Minister without comment. (g) That an experimental farm be established in the light sandy country in the Karoonda district." The Board was of the opinion that an experimental farm in that district was not necessary.

PUBLICATION OF RULES OF AGRICULTURAL BUREAU.

The Lyndoch Branch suggested that the rules governing the Agricultural Bureau should be published in each issue of the *Journal*. The Board decided to publish such rules in the first number of each volume of the *Journal*.

TIMBER IN SANDALWOOD DISTRICT.

The Sandalwood Branch resolved—"That the Government be urged to use greater expedition and enterprise to try and grow useful timbers in this district. The Secretary was instructed to transmit the matter to the Minister with the support of the Board.

NEW BRANCH.

Approval was given for the formation of a new Branch of the Agricultural Bureau at Barmera, with the following gentlemen as foundation members:—R. V. Langdon, A. D. Smith, R. G. Wilton, A. Denison, J. Sabey, J. Martin, W. Driscoll, J. Elliott, N. Fotheringham, R. Wheeler, A. Whitmore, J. Taylor, G. Burns, F. Burchell, W. Gerrard, G. Fraser, W. Germein, D. Leadheater, J. Wilson, J. Wills, J. Datson, E. Schumaker, N. and H. MacKenzie, T. Hoggart, G. Jackson, J. Gow, H. and W. Heathersay, G. Pullin, G. Allister, D. Wright, H. Weall, D. Middleton, S. Vohr, R. Kernot.

LIFE MEMBERSHIP.

The honor of life membership of the Agricultural Bureau was conferred upon Mr. W. Buchanan, who has been a member of the Bureau since 1895.

NEW MEMBERS.

The following names were added to the rolls of existing branches:—Yacka—A. Fuller, R. Abbott, T. Howard, J. Howard; Blyth—C. F. Hutton; Smoky Bay—H. Thomas; Butler—E. B. Whitford; Port Germein—Alford; Port Pirie—H. C. Williams; Mallala—A. Driscoll; Yadrarie—R. B. Deer; Glossop—T. V. Partridge, L. J. Mander, A. Gardner, C. Ralph, A. H. James, C. Leaney, A. West, R. E. Howse, N. E. B. Scholz, A. S. Ebbs, H. R. Clampett, L. W. Dawson, M. W. Nicholas, H. Moss, J. McKay, C. D. Dansie, A. Moodie, W. E. Underwood, A. Harvey, R. R. DeLaine, M. Borden, M. Hamlyn, I. Ivis, B. G. Stacey, W. H. G. Morrell, J. T. Robertson, M. T. Rofe, W. N. Ellis, E. R. Scott, J. J. Hatch, A. Creed, H. F. Tratt; Gumeracha—E. G. Cooper, H. H. Buckley, Crowhurst; Whyte-Yarcowie—T. D. Keatley; Miltalie—K. Harvey; Wudinna—B. Waters; Murray Bridge—Waters, Way, Ive, Sutton, Threadgold, Martin; Netherton—H. McLean; Clare—G. Patterson, R. Stacey, G. Viertorsen; Alawoona—H. Clough, F. Mudge, V. Cottrill; Waikerie—L. Jacobs, L. W. Andrews; Saddleworth (Ladies)—C. A. Warnecke, H. C. Hastings; Maitland—C. C. Parsons; Morehard—A. L. Bettridge, H. Messenger, R. B. Gregory, E. H. Gregory, A. S. Smidt; Tantanoola—H. Holloway, F. Mead, E. H. Pryor, W. Shillabeer; Two Wells—A. A. Wilson, L. L. Wilson; Beetaloo Valley—M. J. Casey; Bute—H. McEvoy; Sandalwood—F. R. Bonsey; Lyndoch, F. P. Nicholas; Lone Gum—A. Jury; Kilkerran—F. J. King; Younghusband—G. H. Brinsley, G. H. Mann, H. Putland, A. Pilmore, H. Bates, K. Wienert, A. Wienert, J. Wienert, F. Wienert, D. Brinkley, F. H. Chambers, N. G. Kelly, H. Gowling, H. Drogemuller, J. Knight, M. Knight, C. Gogel, G. Gogel, H. Baumgurtel, W. Reed, R. Hartman, S. D. Brinkley, W. G. McNeil, W. Duthie, G. Hallet; Gumeracha—C. Almond, A. Colgate; Tarcowie—J. O'Grady.

EGG-LAYING COMPETITION, 1920-1921.

HELD AT THE PARAFIELD POULTRY STATION, PARAFIELD, UNDER THE DIRECTION
OF D. F. LAURIE (GOVERNMENT POULTRY EXPERT AND LECTURER).

A TWELVE MONTHS' TEST STARTED ON APRIL 1ST, 1920, AND TO TERMINATE MARCH 31ST, 1921.]

SECTION I.—LIGHT BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Name and Address.	Bird No.	Month ending 31/10/20.	Score to Date.	Bird No.	Month ending 31/10/20.	Score to Date.	Bird No.	Month ending 31/10/20.	Score to Date.
WHITE LEGHORNS.									
Bertelsmeier, C. B., Kensington ..	1	19	74	2	16	56	3	13	64
McDonnell, G., Auburn, Melbourne	4	8	59	5	6	67	6	Dead	
Stacey, R. S., Hamley Bridge ...	7	16	51	8	7	30	9	19	76
Ryan, J., Silvan, Victoria	10	18	69	11	15	101	12	17	66
Moritz Bros., Kalangadoo	13	22	103	14	3	62	15	19	104
Brown, J. P., Ballarat, Victoria ..	16	13	44	17	7	61	18	13	68
Rogers, A. H., Richmond, S.A. ...	19	2	31	20	21	52	21	12	62
Eckermann, W. F., Eudunda	22	20	71	23	15	65	24	20	51
Burton, C. J., Mallala	25	—	—	26	—	—	27	—	—
Beythien, E. W., Scott's Creek ..	28	7	27	29	9	31	30	11	36
Moritz Bros., Kalangadoo	31	18	64	32	18	81	33	21	95
James, H. B., Kew, Victoria	34	—	38	35	3	43	36	21	97
Monkhouse, A. J., Woodside	37	18	59	38	19	69	39	22	89
Crear, H. S., Broken Hill	40	—	—	41	15	80	42	19	59
Roantree, W., Broken Hill	43	—	—	44	—	—	45	7	28
Beythien, E. W., Scott's Creek ..	46	17	45	47	—	—	48	—	—
Hooking, E. D., Kadina South	49	—	—	50	11	46	51	13	51
Raymoor Poultry Farm, Kilkenny	52	9	33	53	12	56	54	—	—
Keegan, H. V., Wallaroo	55	—	—	56	16	38	57	—	—
Lampert, Mrs. S., Piccadilly	58	3	53	59	17	66	60	18	67
Parsons, E. H., Pinnaroo	61	19	65	62	6	27	63	13	45
Raymoor Poultry Farm, Kilkenny	64	15	77	65	22	74	66	22	54
Stevens, H. J., Broken Hill	1	19	73	2	22	68	3	24	71
Glenelg River Poultry Farm, Mt. Gambier	4	22	102	5	22	101	6	18	108
Wilmington, Mrs. G., Milang	7	20	59	8	16	46	9	18	62
Rutledge, M., Broken Hill	10	20	80	11	—	—	12	19	53
Verooe, Wm., Sefton Park	13	18	66	14	18	89	15	—	—
Stockman, A., Goodwood	16	23	62	17	21	76	18	21	54
Ritter, Wm., Magill	19	21	63	20	17	65	21	19	67
Blake, Mrs. M., Berowra, N.S.W.	22	20	71	23	23	78	24	21	80
Stidston, M., Cheltenham	25	21	61	26	22	95	27	18	98
Bamford, W. H., Glenelg	28	16	83	29	21	108	30	19	91
Windyridge Poultry Farm, Blackwood	31	18	77	32	21	73	33	21	71
Howie, H. H., Mount Gambier ..	34	19	88	35	22	82	36	21	83
Green, A. J., Crystal Brook	37	22	93	38	21	117	39	16	51
Green, F. W. H., Monteith	40	20	105	41	18	93	42	17	86
Rivett, J., Lockleys	43	—	—	44	—	—	45	—	—
Small, E. W., Mount Gambier ..	46	17	51	47	18	61	48	20	51
Herbert, C., Alberton	49	12	64	50	16	57	51	22	96
Holmes, F. A., Naracoorte	52	20	52	53	19	48	54	19	63

* Failed under Regulation 12.

EGG-LAYING COMPETITION—*continued.*

Row No.	Name and Address.	Bird No.	Month ending 31/10/20.	Score to Date.	Bird No.	Month ending 31/10/20.	Score to Date.	Bird No.	Month ending 31/10/20.
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WHITE LEGHORNS—*continued.*

B	Green, F. W. H., Monteith	55	9	49	56	18	98	57	17
B	Herbert, C., Alberton	58	13	47	69	14	42	60	8
B	Uriwin, A. P., Balaklava	61	18	74	62	17	51	63	12
B	Purvis, W., Glanville Blocks	64	15	48	65	16	87	66	6
C	Green, F. W. H., Monteith	1	17	59	2	19	76	3	21
C	Holmes, F. A., Naracoorte	4	20	53	5	19	44	6	—*
C	Axtell, Mrs. J., Glen Osmond	7	20	60	8	21	71	9	20
C	Finn, H. J., jun., Angaston	10	17	43	11	14	43	12	14
C	Coleman, A. C., Grange	13	15	49	14	19	80	15	18
C	Green, F. W. H., Monteith	16	22	101	17	21	98	18	17
C	Anderson, J., Prospect	19	—*	—*	20	—*	—*	21	15
C	Axtell, Mrs. J., Glen Osmond	22	—*	—*	23	14	51	24	9

TWO WHITE LEGHORNS, ONE ANCONA.

O	Tester, Geo. P., Naracoorte	25	14	58	26	20	106	27	15
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SECTION 2.—HEAVY BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENT

BLACK ORPINGTONS.

C	Lawson, E. A., Camberwell, Victoria	28	13	35	29	22	56	30	12
C	Bertelsmeier, C. B., Kensington	31	Dead	32	21	79	33	19	
C	Shaw, R. R., Crystal Brook	34	17	79	35	19	64	36	8
C	Jarman, T. E., Epping, N.S.W.	37	—*	—*	38	—*	—*	39	18
C	Hogg, R. J., Morphett Vale	40	19	45	41	19	62	42	—*
C	Shaw, R. R., Crystal Brook	43	21	73	44	19	49	45	2
C	Holmes, F. A., Naracoorte	46	1	36	47	14	40	48	11
C	Buttfield, C. C., Crystal Brook ..	49	17	61	50	15	40	51	14
C	Shevill, W. A., Beaumaris, Victoria ..	52	16	48	53	—*	—*	54	10
C	Eckermann, W. P., Eudunda	55	—*	—*	56	18	71	57	17
C	Lampert, Mrs. S., Piccadilly	58	13	79	59	20	55	60	—*
C	Bansemmer, Mrs. B., Beaumont ..	61	14	71	62	20	85	63	13
C	Siebler, J. M., North Broken Hill ..	64	—*	—*	65	—*	—*	66	9
D	Holmes, F. A., Naracoorte	1	29	132	2	Dead	3	27	
D	Purvis, W., Glanville Blocks	4	23	70	5	Dead	6	15	
D	Bertelsmeier, C. B., Kensington ..	7	25	114	8	20	67	9	26
D	Tester, G. P., Naracoorte	10	19	55	11	14	43	12	23
D	Kalms, A. G., Neale's Flat	13	Dead	14	14	55	15	2	

RHODE ISLAND REDS.

D	Stacey, R. S., Hamley Bridge ..	16	14	41	17	10	36	18	21
D	Stockman, A., Goodwood	19	1	66	20	17	74	21	10

RHODE ISLAND WHITES.

D	Bansemmer, Mrs. B., Beaumont ..	22	23	52	23	—*	—*	24	26
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* Failed under Regulation 12.

SECTION 3.—LIGHT BREEDS (PEN TEST). SIX PULLETS IN EACH PEN.

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending 31/10/20.	Total Eggs Laid from 1/4/20 to 31/10/20.
1	Hodges, F., Ballarat North, Victoria	White Leghorns	125	641
2	Bertelsmeier, C. B., Kensington	"	115	515
3	Beythien, E. W., Scott's Creek	"	115	383
4	McDonnall, G., Anburn, Victoria.....	"	120	528
5	Bertelsmeier, C. B., Kensington	"	111	493
6	Thompson, E. F., Franklin.....	"	108	507
7	Purvis, W., Glanville Blocks	"	102	513
8	Smith & Gwynne, Gawler South ...	"	101	433
9	Anderson, S., Gawler Railway	"	117	619
10	Eckermann, W. P., Eudunda	"	102	454
11	Beythien, E. W., Scott's Creek	"	101	413
12	George, R., New Queenstown.....	"	102	581
13	Deacon, J. R., Solomontown	"	98	521
14	Alford, Thos., Broken Hill	"	111	643
15	Evans, H. A., Richmond	"	—*	—*
16	Connor, D. C., Gawler	"	101	446
17	Raymoor Poultry Farm, Kilkenny Blocks	"	106	556
18	Lampert, Mrs. S., Piccadilly.....	"	82	365
19	Pool, F. J., North Norwood	"	95	352
20	Woodhead, N., Torrens ville	"	102	422
21	Thompson, E. F., Franklin.....	"	111	398
22	Randall, J., Bowden	"	74	260
23	Earle, E., Solomontown	"	—*	—*
24	Willington, Mrs. G., Millang	"	109	448
25	Veroce, Wm., Sefton Park	"	108	583
26	Pugeley, A., Hindmarsh	"	83	359
27	Howie, H. H., Mount Gambier.....	"	89	463
28	Purvis, W., Glanville Blocks	"	109	420
29	Anderson, W., Kapunda	"	73	338
30	Broderick, P. J., Burra	"	—*	—*
31	Eldridge, J. H., Norwood	"	95	483
32	Pope Bros. & Co., Hectorville	"	68	335
33	Oakey, E., Mannahill	Brown Leghorns	91	356

SECTION 4.—HEAVY BREEDS (PEN TEST). SIX PULLETS EACH ENTRY.

34	Hogg, R. J., Morphett Vale	Black Orpingtons ..	—*	—*
35	Bertelsmeier, C. B., Kensington.....	"	—*	—*
36	Eckermann, W. P., Eudunda	"	58	436
37	Lampert, Mrs. S., Piccadilly.....	"	74	444
38	Bertelsmeier, C. B., Kensington	"	18	366
39	Bansemmer, Mrs. B., Beaumont	"	74	337
40	Purvis, W., Glanville Blocks	"	—*	—*
41	Siebler, J. M., North Broken Hill ...	"	—*	—*
42	Bertelsmeier, C. J., Kensington	"	—*	—*
43	Purvis, W., Glanville Blocks	"	—*	—*
44	Frost, F. W., Wallaroo	Barred Rocks	95	268
45	Lampert, Mrs. S., Piccadilly	Black Orpingtons	95	631

* Failed under Regulation 12.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of October, 1920, also the average precipitation to end of October, and the average annual rainfall.

Station.	For Oct., 1920.	To end Oct., 1920.	A'ge. to end Oct.	A'ge. Annual Rainfall	Station.	For Oct., 1920.	To end Oct., 1920.	A'ge. to end Oct.	A'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta	1.95	7.75	4.03	4.73	Spalding	3.92	21.17	17.60	20.18
Marree	0.53	9.12	4.95	6.02	Gulnare	1.90	19.63	16.77	18.45
Farina	0.46	7.76	5.54	6.57	Yacka	2.16	15.59	13.60	15.25
Copley	0.68	9.09	6.98	8.30	Koolunga	2.39	15.04	14.03	15.75
Beltana	1.45	8.99	7.48	8.93	Snowtown	1.71	14.47	14.28	15.45
Blinman	1.92	12.95	10.75	12.52	Brinkworth	2.43	17.07	14.20	15.91
Tarcoola	2.26	12.68	6.20	7.33	Blyth	2.43	17.45	14.87	16.52
Hookina	0.86	17.01	10.45	12.65	Clare	2.26	25.01	21.87	24.45
Hawker	1.29	17.71	10.63	12.37	Mintaro	2.36	25.13	20.83	23.40
Wilson	1.30	17.79	10.33	11.85	Watervale	2.84	25.91	24.71	27.40
Gordon	1.06	13.68	9.12	10.43	Auburn	2.54	22.25	15.23	24.35
Quom	0.72	16.58	12.22	13.79	Hoyleton	2.81	15.70	15.82	17.82
Port Augusta	1.01	12.02	8.21	9.42	Balaklava	2.37	15.03	13.97	15.45
Port Augusta West	0.98	12.11	8.17	9.36	Port Wakefield	2.14	13.62	11.82	13.14
Bruce	1.09	12.74	9.68	9.99	Terowie	1.66	10.69	11.66	13.54
Hammond	1.74	14.78	9.88	11.36	Yarowie	1.74	11.85	12.26	13.45
Wilmington	1.27	18.46	15.10	18.06	Hallett	1.31	14.61	14.29	16.25
Willowie	1.30	13.31	9.94	11.82	Mount Bryan	1.48	14.94	14.43	16.35
Melrose	2.05	23.37	20.78	23.11	Burra	2.02	17.02	15.95	17.41
Booleroo Centre	1.85	14.27	13.61	15.51	Farrell's Flat	1.97	17.62	16.94	18.85
Port Germein	2.06	12.20	11.04	12.65	WEST OF MURRAY RANGE.				
Wirrabara	1.94	22.36	17.33	19.44	Manoora	3.13	19.89	16.68	18.54
Appila	1.26	13.55	11.90	14.90	Saddleworth	2.80	17.76	16.52	19.75
Cradook	1.67	16.83	9.79	10.82	Marrabel	3.12	20.35	16.40	19.44
Carrieton	1.33	16.02	10.68	12.34	Riverton	2.63	17.55	18.50	20.74
Johnburg	0.99	12.91	8.79	10.22	Tarlee	2.11	14.22	16.00	17.46
Eurelia	1.21	14.68	11.44	13.11	Stockport	2.29	15.25	14.44	16.36
Orroroo	0.84	13.44	11.63	13.42	Hamley Bridge	2.31	14.31	14.52	16.55
Nackara	1.45	13.72	9.47	10.63	Kapunda	2.33	13.72	16.75	19.84
Black Rock	0.89	14.32	10.60	12.29	Freeling	2.08	14.36	15.87	17.45
Ucolta	0.53	10.21	10.28	11.65	Greenock	2.27	17.32	19.20	21.75
Peterborough	0.74	12.04	11.43	13.28	Truro	2.43	16.48	18.01	20.11
Yongala	1.02	14.48	12.30	14.13	Stockwell	2.34	16.10	18.03	20.46
LOWER NORTH-EAST.					Nuriootpa	2.47	17.40	18.72	21.45
Yunta	1.44	11.15	7.19	8.40	Angaston	3.24	20.87	20.05	22.54
Waukarina	1.61	10.83	6.81	8.15	Tanunda	1.96	18.79	19.97	22.35
Mannahill	1.48	7.90	7.08	8.51	Lyndoch	2.62	24.58	20.49	22.81
Cockburn	1.98	10.29	6.80	8.03	Williamstown	2.43	25.93	25.07	27.74
Broken Hill, NSW	1.78	9.30	8.36	9.89	ADELAIDE PLAINS.				
LOWER NORTH.					Mallala	2.12	14.96	14.79	16.61
Port Pirie	2.52	13.53	12.72	13.26	Roseworthy	2.49	16.08	15.42	17.35
Port Broughton	1.59	14.64	12.67	14.13	Gawler	2.88	18.65	17.15	19.14
Bute	2.27	14.60	14.03	15.55	Two Wells	2.46	14.75	14.26	15.95
Laura	1.34	18.38	16.42	18.12	Virginia	2.29	17.11	15.44	17.31
Caltowie	2.01	15.71	14.95	17.02	Smithfield	2.82	17.30	14.98	17.15
Jamestown	1.89	19.33	14.55	17.56	Salisbury	2.48	16.02	16.60	18.55
Bundaleer W. Wks.	2.44	19.50	15.40	17.56	North Adelaide	4.30	26.00	19.66	21.45
Gladstone	1.32	15.91	14.13	16.05	Adelaide	2.90	22.31	18.85	21.40
Crystal Brook	2.29	17.63	13.73	15.62	Glenelg	2.75	17.73	16.51	18.45
Georgetown	3.20	20.99	16.28	18.30	Brighton	2.37	21.54	19.00	21.45
Narridy	1.63	14.26	15.62	16.43	Mitcham	3.25	27.68	21.45	23.62
Redhill	3.33	18.06	14.97	16.66	Glen Osmond	3.19	26.87	23.29	25.75
					Magill	2.60	23.32	22.72	25.35

RAINFALL—continued.

Station.	For Oct., 1920.	To end Oct., 1920.	A'ge. to end Oct.	A'ge. Annual Rainfall	Station.	For Oct., 1920.	To end Oct., 1920.	A'ge. to end Oct.	A'ge. Annual Rainfall
MOUNT LOFTY RANGES.					WEST OF SPENCER'S GULF—continued.				
tree Gully.....	3-08	26-33	24-86	27-73	Port Lincoln.....	1-11	19-33	13-06	19-83
ling West.....	4-14	43-42	42-70	46-82	Tumby.....	1-41	14-28	12-75	14-76
idla.....	3-91	36-83	40-55	44-49	Carrow.....	1-85	11-74	11-75	15-14
rendon.....	2-54	28-56	30-08	33-18	Arno Bay.....	1-85	11-01	—	13-10
phett Vale.....	2-81	20-56	20-30	22-90	Clave.....	3-79	—	—	—
rhunga.....	2-80	21-26	19-60	20-21	Cowell.....	1-83	9-00	10-38	11-56
lunga.....	3-20	27-60	23-66	25-82	Point Lowly.....	2-69	10-53	10-21	11-84
inga.....	2-61	20-37	18-29	20-22	Minnipa.....	2-10	—	—	—
ponga.....	2-61	28-43	—	—	YORK PENINSULA.				
manville.....	1-81	20-74	19-17	20-53	Wallaroo.....	1-54	13-39	12-81	14-11
skalilla.....	1-82	23-78	21-60	22-93	Kadina.....	1-29	16-67	14-62	15-93
nt Pleasant.....	4-05	29-05	24-62	27-01	Moonla.....	1-04	13-52	13-90	15-31
wood.....	2-74	25-59	26-78	29-43	Green's Plains.....	1-66	15-08	14-37	15-75
neracha.....	2-81	30-88	29-97	33-33	Maitland.....	1-37	16-84	18-36	20-20
brook Ravr.....	3-00	—	—	—	Ardrossan.....	1-66	12-67	12-64	13-96
edvale.....	3-66	34-21	32-65	35-60	Port Victoria.....	1-31	13-94	13-95	15-34
odside.....	3-09	31-96	29-31	32-05	Curramulka.....	1-57	14-90	16-80	18-31
bleside.....	3-21	30-70	31-72	34-81	Minlaton.....	1-33	17-82	16-27	17-70
rne.....	3-01	24-56	25-63	28-58	Brentwood.....	1-15	14-99	13-94	15-44
nt Barker.....	3-48	30-40	28-41	31-10	Stansbury.....	1-10	13-78	15-60	17-08
unga.....	3-02	32-25	—	32-94	Warooka.....	1-69	15-24	16-38	17-74
elefield.....	2-69	27-47	27-05	30-60	Yorketown.....	0-92	16-73	15-77	17-29
adows.....	3-26	31-53	31-73	36-26	Edithburgh.....	0-98	13-94	15-05	16-58
thalybn.....	2-04	16-82	17-43	19-28	SOUTH AND SOUTH-EAST				
MURRAY FLATS AND VALLEY.					Cape Borda.....	1-52	29-48	23-09	24-96
ingie.....	1-27	13-96	16-80	18-77	Kingscote.....	1-72	27-60	17-25	18-92
ung.....	1-35	11-82	13-87	15-56	Penneshaw.....	1-81	20-31	19-64	21-39
ghorne's Bdgr.....	1-73	12-41	12-85	14-59	Victor Harbor.....	1-66	18-89	19-50	21-56
lington.....	1-52	10-72	12-19	14-82	Port Elliot.....	1-84	18-87	18-18	20-00
em Bend.....	1-61	11-50	12-44	14-55	Goolwa.....	1-86	14-34	16-03	17-87
ray Bridge.....	1-22	9-83	12-25	13-98	Mindarie.....	2-95	—	—	—
ington.....	1-92	12-00	13-78	15-45	Karoonda.....	1-82	—	—	—
unum.....	1-77	9-69	10-23	11-51	Meribah.....	2-60	—	—	—
ner.....	2-27	14-94	13-47	15-23	Pinnaroo.....	1-87	13-76	14-18	15-57
an.....	3-06	10-73	10-63	12-07	Parilla.....	1-51	15-54	11-89	14-02
n Reach.....	2-30	10-26	9-23	10-80	Lameroo.....	1-48	14-79	14-20	16-45
chettown.....	0-73	6-34	8-85	10-26	Parrakie.....	2-07	15-00	12-38	14-42
lunda.....	3-00	15-41	15-34	17-51	Geracium.....	1-86	15-97	13-76	16-24
erlands.....	1-83	9-33	9-38	10-90	Peake.....	2-41	15-43	13-96	16-25
gan.....	1-56	8-46	7-68	9-13	Cooke's Plains.....	1-56	11-56	13-25	15-00
kerie.....	1-68	9-69	7-79	9-41	Coomandook.....	1-01	12-90	15-53	17-75
eland Corner.....	1-87	8-74	9-35	11-11	Coonalpyn.....	0-84	12-65	15-60	17-64
ton.....	2-84	14-05	10-40	12-27	Tintinara.....	0-80	14-66	15-40	18-83
mark.....	2-24	11-08	10-11	10-92	Keith.....	0-77	14-93	16-01	18-54
WEST OF SPENCER'S GULF.					Bordertown.....	0-89	16-20	17-17	19-52
la.....	1-46	8-03	9-52	10-03	Wolsley.....	1-34	16-95	18-07	18-07
te Well.....	0-64	6-87	7-90	9-24	Frances.....	0-65	13-91	17-67	20-10
ler's Bay.....	1-29	15-27	11-40	12-11	Naracoorte.....	1-17	20-14	22-21	22-53
ong.....	0-89	11-79	11-19	12-26	Penola.....	1-25	23-11	23-50	26-48
st Bay.....	0-77	9-00	9-13	10-47	Lucindale.....	0-97	22-24	20-58	22-93
ky Bay.....	1-15	12-79	9-18	10-37	Kingston.....	1-17	22-16	22-08	24-51
na.....	1-30	15-25	11-57	12-97	Robe.....	1-34	27-43	22-45	24-60
ky Bay.....	1-00	19-68	13-37	15-09	Beachport.....	0-92	28-15	24-87	27-29
a.....	1-31	17-62	13-68	15-35	Millicent.....	1-51	32-70	26-62	29-29
Elliston.....	1-77	24-61	—	16-37	Kalangadoo.....	1-74	30-61	—	—
mins.....	1-69	18-95	—	—	Mount Gambier ..	1-31	25-37	27-00	31-66

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on November 1st:—

BUTTER.—Although there is a continuance of heavy supplies of butter being marketed, it is gratifying to see the excellent clearances that are being effected. The weather has not been warm enough so far this season to interfere with the condition. Increasing quantities of factory and creamery butter are being placed in cold store on account of the Imperial Government contract, and any surplus beyond local requirements of separator or private dairies has been readily cleared to packers for export. Values in top grades well maintained, whilst store and collectors show a slight firming. At the close of the month factory and creamery, in prints, sold at from 2s. 5d. to 2s. 6½d. per lb.; best separators and dairies, 2s. 8d. to 2s. 4d.; fair quality, 2s. 1d. to 2s. 2d.; store and collectors, 1s. 11½d. to 2s. 0½d. per lb.

EGGS.—Values have shown slight fluctuations throughout the month. Demand has been exceptionally good, many oversea buyers operating here. Present quotations are:—Hen, 1s. 7½d.; duck, 1s. 8½d. per dozen.

CHEESE.—South-Eastern factories have sent along large quantities, coupled with Queensland cheese offering on this market, so that it was not unexpected that prices should come back; matured selling at 1s. 3½d. to 1s. 4d.; new makes, 13d. to 13½d. per lb. for large to loaf.

HONEY continues very scarce for prime samples, which are finding sale at 8d. to 8½d., but second grades are more plentiful, but demand not so active, price being 6d. to 6½d. per lb. Beeswax very saleable at 2s. per lb.

ALMONDS are practically off the market, last season's crop being cleared. Buyers are offering 10½d. for Brandis; mixed softshells, 9d. to 9½d.; hardshells, 5½d. to 6d.; kernels, 2s. 3½d. per lb.

BACON.—This line has been very short, while the high prices ruling have very much interfered with demand. Sides selling at 1s. 8d.; middles, 1s. 9d. Hams.—Buyers are already purchasing in anticipation of Christmas demands, best handy weights selling at 2s. per lb.

LIVE POULTRY.—Competition throughout the month has been exceedingly brisk, and although fair quantities have come forward, still the supply has not been nearly equal to trade wants, resulting in bidding being keen, and very satisfactory rates have ruled for consignors. Heavy-weight table roosters, 6s. 6s. to 9s. each; nice-conditioned cockerels, 5s. 6d. to 6s. 6d.; plump hens, 5s. 3d. to 7s. 3d.; light birds, 3s. 6d. to 5s. 7d.; ducks, 3s. 8d. to 6s. 6d.; geese, up to 13s. 9d. each; pigeons, 9d. to 1s. 1d. each; turkeys, from 1s. 10d. to 2s. 3d. per lb. live weight for good to prime table birds.

POTATOES.—Values for old potatoes in Victoria eased considerably during the last few weeks, which is reflected in prices here. On the other hand, supplies of new are now coming forward a bit more freely. **ONIONS.**—Supplies of old season's are now gutted, and only new ones are offering. Quotations.—Potatoes—Victorian, £11 to £12 per ton on trucks Mile End; new, £18 to £22 per ton. Onions—New, 16s. to 18s. per cwt. in the market.

Oil and Petrol
Engines

Lister
BRITISH BUILT

Sheep
Shearing
Machine.



The LISTER
Hand Piece.



LET US DEMONSTRATE THIS TO YOU.

Two things are necessary in order to give the greatest return from your Flocks:—

- (1) EVERY PARTICLE OF WOOL.
- (2) Shearing done in the quickest possible time.

The LISTER NEW HAND PIECE does both.

Install a British **LISTER** Oil and Petrol Engine

NO POWER USER SHOULD BE WITHOUT ONE.

VISIT OUR SHOWROOMS and see this grand little engine.

— THE —

"L.K.G." MILKING MACHINE

Has many imitators, but leading dairymen have proved that no other machine will give equal results.

DON'T BE MISLED.

THE "L.K.G." IS THE ONLY MACHINE THAT EMBODIES THE RIGHT PRINCIPLE, AND HAS STOOD THE TEST OF YEARS.
MAKE YOUR INQUIRIES TO-DAY.

The "ALFA LAVAL" Cream Separator

Used by 3,000,000 farmers who wanted and got the best and closest skimming. All who put the "Alfa" to the test declare that for clean skimming, easy turning, and all round general efficiency it stands supreme. Prepare for the coming season by purchasing an "Alfa" now. Allowances made on old machines. Write for Illustrated Catalogue and full particulars.

SOLE AGENTS for these Big Money and Labor Savers:

A. W. SANDFORD & Co., Ltd.,
GRENFELL STREET.

THE AGRICULTURAL OUTLOOK.

REPORTS FOR THE MONTH OF OCTOBER.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

Booberowie.—Weather—Mild weather prevailed up to the time of writing (October 29th), and 204 points of rain were registered, which, coupled with warm weather, has been very beneficial to the growth of crops and feed. Crops are all looking well, and some heavy hay and grain yields should be obtained. Oats and barley are out in ear in many instances, and the wheat is just coming into ear. Natural feed is very abundant. Stock are all in good condition. Miscellaneous—Shearing is nearly completed.

Eyre's Peninsula.—Weather—This has been the wettest October experienced during the last six years, over 2in. of rain being registered. The total for the year is now over 16in.—more than 2in. above the average, and the falls compare with those of 1916—our highest grain yielding season to date. Strong winds have been fairly plentiful for the month, changing from all quarters, but mostly varying north to west. Crops are in a good healthy condition, only very small patches of rust being in evidence, and odd plants of takeall are noticeable. Some early-sown heavy hay crops have lodged badly, causing much difficulty at haymaking. Quite a lot of hay is being cut in the district. Natural feed is very plentiful.

Turretfield.—Weather—Thunderstorms have been numerous this month, and heavy rains and rough winds have knocked the crops about badly; many heavy crops are much tangled. The rainfall for this month has been 221 points. Crops are very good in some fields; some sown when the rain first fell are very dirty, the weeds having nearly choked the crops right out; others, sown a bit later, are exceptionally heavy. Natural feed is very plentiful, this being one of the best years for feed for some time. Stock running in the fields are in good condition. The working stock show the effects of the heavy cultivation required in a season such as this. Pests—Snakes seem more plentiful than usual. Miscellaneous—Haycutting has started in some of the early crops.

MARINE FIBRE.

A report from the Acting Trade Commissioner in London, intimating that an inquiry has been received for a parcel of 2,000 tons of marine fibre, is of particular interest to South Australia. This material is the fibrous portion of the leaf sheath of the sea plant *Poisidonia australis*, which grows abundantly in the shallow water around the coasts of South Australia, and on other parts of the Australian coast. It is reported that a process by which this material can be rendered soft and pliable, to be manufactured into tweeds, &c., has been discovered and patented on the Continent of Europe, and the Trade Commissioner states that he has been shown a large number of samples of excellent materials which have been manufactured from it.

HIGHEST HONORS FOR EFFICIENCY.

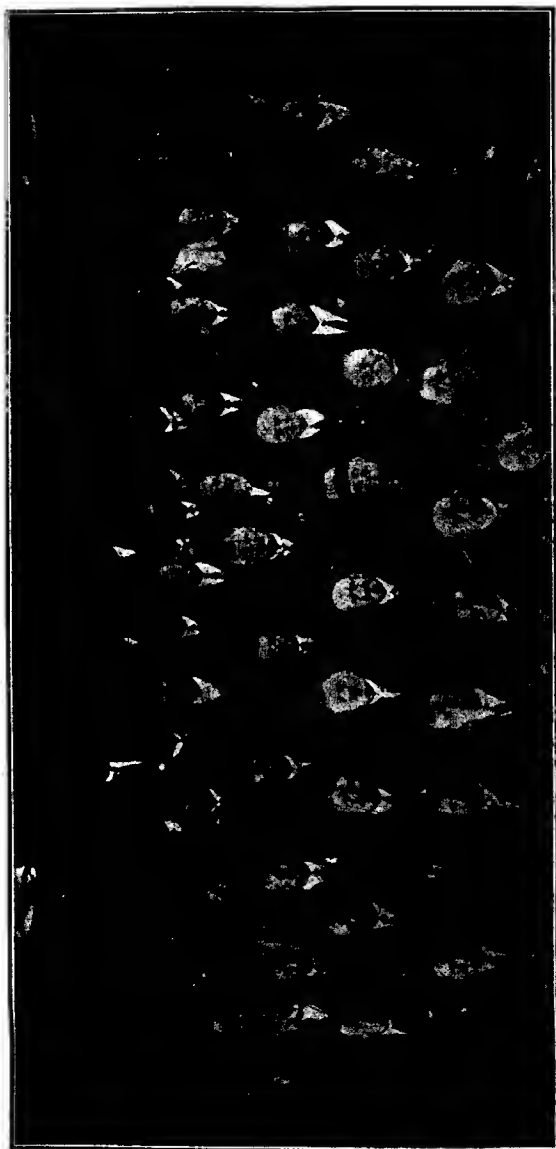
"Commonwealth"	"Union" Brand Cement
"Gisko"	Rabbit Poison
"Hick's"	"Ideal" Poison Carts
"Hurst's"	Wool Bale Fasteners
"Destruo"	Fly Traps
"I.X.L."	Rabbit Poison
"Jumbuck"	Sheep Branding Fluids
"E.R.B."	Crutching Outfits
"Koerstz"	Wool Presses
"Quibell's"	Liquid and Powder Sheep Dips
"Wolseley"	Sheep Shearing Machinery
"Kerol"	Disinfectant
"Torfol"	Sanitary Paint
"Prophylactic"	Sheep Lick

STOCKS OF ALL LINES OF STATION REQUISITES
ON HAND AND TO ARRIVE.

DALGETY AND COMPANY, LIMITED

CURRIE STREET, ADELAIDE,

AND ALL BRANCHES.



Delegates who attended the Annual Conference of Hills Branches of the Agricultural Bureau held at Blackwood on September 30th.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE OF HILLS BRANCHES.

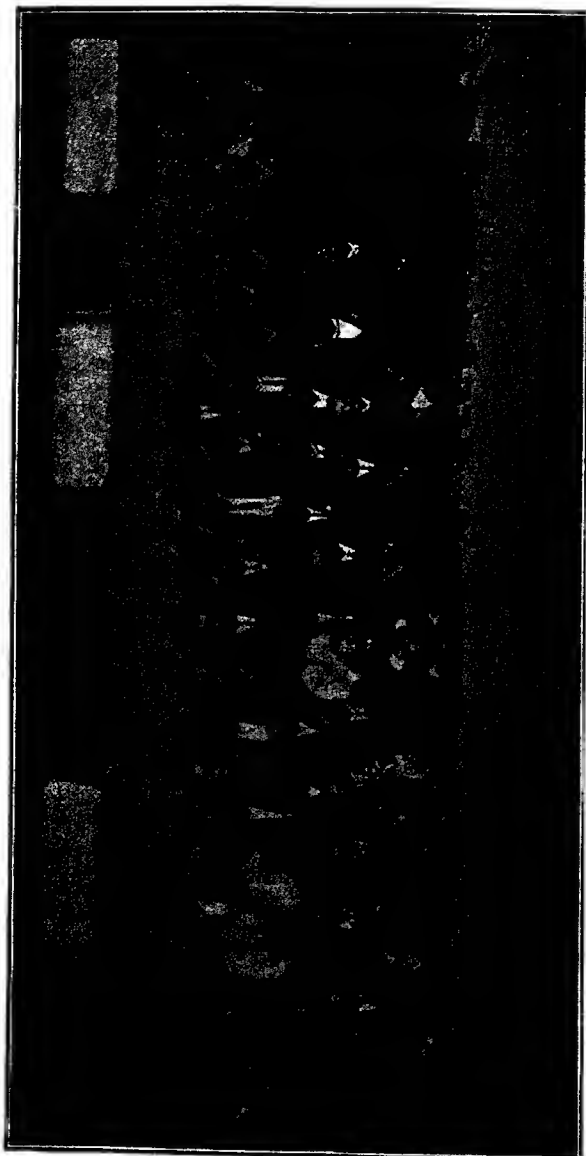
The twenty-fourth Annual Conference of Hills Branches was held at Blackwood on Thursday September 30th, 1920. In addition to a large number of visitors, delegates were present from the following Branches:—Blackwood, Uraidla and Summertown, Cherry Gardens, Iron Bank, Longwood, and Clarendon. Proceedings were commenced by a short address from the Chairman of the local Branch (Mr. S. Chapman), in which he extended a cordial welcome to the officers representing the Department of Agriculture:—The Hon. the Minister of Agriculture (Hon. T. Pascoe), the Director of Agriculture (Professor Arthur J. Perkins), the Horticultural Instructor (Mr. Geo. Quinn), the Secretary to the Minister (Mr. W. L. Summers), Captain S. A. White and Mr. H. Wicks (members of the Advisory Board of Agriculture), Mr. R. Fowler (Manager of the Blackwood Orchard), and the Acting Secretary of the Advisory Board (Mr. H. J. Finnis).

The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), in the course of his opening address, contrasted the northern and southern portions of the State, and referred to the advantage that the Hills people had in the great diversity of agricultural practice which their conditions permitted. Two hitherto practically uncultivated lines in South Australian agriculture were tobacco and sugar beet, and both seemed to offer opportunities for the establishment of new industries. The Minister referred at length to the outlook for the fruitgrowing industry, and emphasised the obligation on the part of the Government to see that the industry was catered for and new markets found. He then declared the Conference open. At the instance of Mr. W. G. Summers (Blackwood), seconded by Mr. C. Ricks (Cherry Gardens), a hearty vote of thanks was accorded the Minister for his opening address.

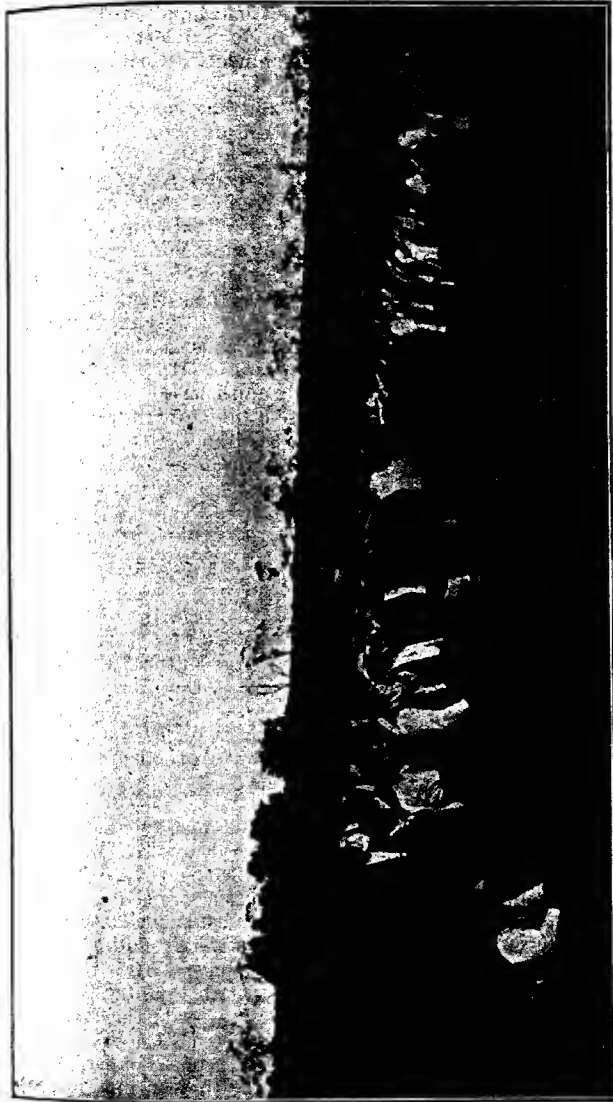
PAPERS AND DISCUSSIONS.

The first business dealt with was a paper by Mr. S. Smith (Longwood), entitled "Birds and the Man on the Land." The question raised was vigorously debated by delegates. After the luncheon adjournment Mr. A. W. Magarey (Blackwood) contributed a paper, "The Grading and Packing of Fruit." A delegate from the Longwood Branch (Mr. E. W. Beythein) then dealt with the subject, "Feeding for Egg Production." The Horticultural Instructor (Mr. G. Quinn) delivered an address, "Fungus Diseases of Fruit Trees," and replied to numerous questions.

During the course of the "Free Parliament" it was unanimously decided that the next Conference should be held at Longwood. The following resolutions were also carried:—(a) "That in the opinion of this Conference a standard for mill offal should be fixed and enforced by the Government." (b) "That this Conference is of the opinion that it is desirable in every way to further the planting, both by Government and private enterprise, of soft wood timbers in this State."



Delegates who attended the Second Annual Conference of Eyre's Peninsula Branches of the Agricultural Bureau at the Government Experimental Farm, Minniba, on October 21st and 22nd.



The Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.) operating on Veterinary Cases at the Second Annual Conference of Eyre Peninsula Branches of the Agricultural Bureau.

CONFERENCE AT MINNIPA.

On the Government Experimental Farm, Minnipa, on Thursday and Friday last, October 21st and 22nd, about one hundred delegates representing Branches of the Agricultural Bureau met to attend the Second Annual Conference of the Eyre Peninsula Branches. Minnipa is situated about 158 miles north of Port Lincoln, alongside the railway which connects Port Lincoln with Cape Thevenard. It is fairly centrally situated in so far as Eyre Peninsula is concerned; but, nevertheless, many of the delegates had long distances to travel. The Branches represented were Green Patch, Edillilie, Koppio, Collie, Big Swamp, Yadnarie, Butler, Yeelanna, Yaninee, Colton, Wudinna, Streaky Bay, Talia, Petina, Mount Hope, and Minnipa. In many instances horse-drawn vehicles were the only means of transit available to delegates, and some of these faced journeys of up to nearly 100 miles, along bush tracks, bringing with them their blankets and their "billies." Their cheery optimism revealed their absolute faith in the future of Eyre Peninsula. To the sceptic, if such there were, they pointed out the magnificent crops that graced the cleared patches amongst the native scrub. Nor is their faith based on the insecure foundation of one year's experience. Like the agriculturists of other areas, they have suffered from Nature's hard knocks at times, but the average annual return of 21.18 bush. of wheat per acre which the Government Experimental Farm has yielded since 1915 indicates that there is a future for the wheatgrowers on Eyre Peninsula. And they believe in it to a man.

THE CONFERENCE.

The conference was opened on Thursday by the Director of Agriculture (Professor A. J. Perkins), who was supported on the platform by the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.), the Horticultural Instructor (Mr. G. Quinn), the Dairy Expert (Mr. P. H. Suter), the Superintendent of Experimental Works (Mr. W. J. Spafford), and the Acting Secretary of the Advisory Board of Agriculture (Mr. H. J. Finnis).

The chair was occupied by Mr. G. V. Lindquist (President of the Minnipa Branch). Business was commenced by Mr. E. M. Sage (Green Patch), who, in a paper, entitled, "The Capacity of Eyre Peninsula to support Freezing Works," made a strong plea on behalf of the stock-raising potentialities of the peninsula, and the need for marketing facilities, the absence of which so severely militated against the successful occupation of many of the holdings. After this subject had been debated, a paper, "Farming in Heath Country," from the pen of Mr. V. Harding, of Mount Hope, was read; the Manager of the Government Experimental Farm (Mr. L. F. Cook) dealt with wheat varieties; and Mr. R. Hull (Colton), in a paper, entitled, "Marketing Wheat," made a strong case for the continuation of the present system of handling the wheat crop, which was heartily supported by the delegates.



Delegates inspecting Hand Plots at the Government Experimental Farm, Minniba.

On Friday morning a tour of inspection of the Government Experimental Farm was made. The party visited each of the fields under crop, the olive nursery, the orchard, and discussed with officers of the department the cultivation, seed, manure, pickling, and variety tests being conducted. The lucerne, grass, and fodder plots, as well as stock and buildings, came under notice.

In the afternoon the Principal of the Roseworthy Agricultural College (Mr. W. J. Colbatch, B.Sc. (Agric.), M.R.C.V.S.), operated on veterinary cases, which had been brought along by delegates, and took the opportunity of going over the points of the horse for the benefit of the conference. Papers, entitled, "Essentials in the Development of Eyre Peninsula" and "A Better Method of Inducing Returned Soldiers to Settle on Crown Lands," were read by Messrs. R. Hicks (Yaninee) and I. H. Head (Minnipa) respectively.

RESOLUTIONS.

A number of resolutions dealing with matters of importance to the agricultural interests of the peninsula were passed. These were as follow:—

1. That this conference strongly urges the Government to take a referendum of the wheatgrowers of this State in order to ascertain the views of the wheatgrowers regarding the continuance of the Wheat Pool.
2. That all the resolutions submitted to the Minister of Agriculture by the deputation of delegates of the West Coast Branches be referred back to the Minister for a definite reply.
3. That this conference, representative of the Branches of the Bureau on Eyre Peninsula, protests strongly against the third jetty being built at Port Lincoln, and insists on having a wharf.
4. That this conference asks the Railway Department to provide adequate trucking facilities and sheets for the coming season's super.
5. That the Advisory Board be asked to investigate whether measures can be taken to protect wheatgrowers against kangaroos without removing them from the list of protected animals.
6. That settlers in mallee hundreds in all parts of the State, and particularly on Eyre Peninsula, be relieved of their obligations in respect of the clearing of scrub, to the extent of the value that they can conserve water.
7. That this conference urges the Government to push on with the Poldo water scheme, ultimately utilising the reticulation in connection with the Tod River water scheme.
8. That this conference, through the Advisory Board, strongly urges that a small motor train similar to that used on the South-Eastern railway lines, be stationed on the Thevenard line.
9. That this conference asks the State Government to approach the Federal Government with a view of forming a local Repatriation Committee for the central hundreds of Eyre Peninsula.



Breakwind of "*Casuarina glauca*" surrounding Orchard of the Government Experimental Farm, Minnipa. Planted 1918.



Rye on the Government Experimental Farm, Minnipa.

10. That the State Railways Department be approached with a view of getting a refrigerating car on the Eyre Peninsula railway lines for the purpose of carrying perishable goods during the summer months.

11. That this conference urge upon the Government that we want at least 5s. for the first payment on this year's wheat.

12. That the next conference be held at the Government Farm, Minnipa, 12 months from the date of the 1920 conference.

13. That the Railways Standing Committee be urged to visit Eyre Peninsula at an early date, with a view to inquiring into the necessity for more adequate railway facilities, more particularly to open up new land in a north-westerly direction from Kimba, to connect Mount Damper with the existing trunk line, and to connect Poochera Siding and Stokes Corner.

CONFERENCE OF MURRAY LANDS BRANCHES.

For the first time the Murray Lands Branches of the Agricultural Bureau met in Conference at Karoonda on Tuesday, October 5th. This district, which was formerly part of the Pinnaroo Conference district, comprises the areas served by the Paringa, Loxton, and Waikerie lines of railway. Although the Murray Lands district settlers have many problems and difficulties in common with the Pinnaroo district agriculturists, the means of communication between the two districts militated against the adequate representation of Branches in the former district at the Pinnaroo Conference, which is held annually at one of the centres between Tailem Bend and Pinnaroo.

The innovation can be regarded as distinctly successful, and although the attendance was not large, it was representative. The Department of Agriculture was represented by the Chairman of the Advisory Board (Mr. C. J. Tuckwell), the Superintendent of Experimental Work (Mr. W. J. Spafford), and the Acting Secretary Advisory Board (Mr. H. J. Finnis). After the Chairman of the Advisory Board had delivered an opening address, a paper, entitled "Sheep on a New Mallee Farm," was read by Mr. E. L. Cowled (Borrika Branch). The first point that should receive attention, the writer of the paper urged, was fencing and the subdivision of the holding. He then discussed the relative advantages of breeding and dealing, expressing a personal preference for the former. He suggested making a commencement with Merinos, and concluded by advising intending sheep owners to procure good classes of sheep, and avoid overstocking.

FREE PARLIAMENT.

Attention was then given to a number of questions, and various resolutions were carried. At the instance of Mr. J. R. Beek (Wynarka) it was decided to recommend that the Chief Inspector of Stock be

instructed to investigate all deaths of stock reported from other than natural causes. A resolution asking that a veterinary surgeon be stationed in the district, and that a fee be charged for his services, was carried, as was also one urging the establishment of an experimental farm in the light sandy country of the Karoonda district. Mr. E. W. Cowled (Borrika) moved, "That the Government be asked to provide roads for the settlers on the mallee lands," and the motion was carried. It was resolved, "That the Conference considers that when a genuine applicant can be obtained, vacant blocks should be allotted at a fair valuation, the Government cutting the loss where necessary," and also "That in fencing joint boundaries of blocks, the Crown be placed in the same position as an ordinary lessee." At the instance of the Chairman (Mr. F. G. Williams) it was decided, "That the Government be urged to have taught in our public schools amongst our children a desire for things Australian, and to think Australian." Free Parliament was brought to a close by a resolution expressing sympathy with Mr. F. E. Place, B.Sc., M.R.C.V.S., who had suffered as the result of a severe accident.

Many useful hints for the guidance of the new mallee settler were given in a paper read by Mr. Sanders (Nunkeri and Yurgo Branch), under the title, "Course of Action on a New Mallee Block."

The Superintendent of Experimental Work (Mr. W. J. Spafford) delivered an address dealing with the cultivation of sandy land.

IMPORTS AND EXPORTS OF FRUIT, PLANTS, ETC.

During the month of September, 1920, 7,269bush. of bananas, 508bush. of fresh fruits, 23,321 bags of potatoes, 25bush. of cucumbers, 26 packages of bulbs, 16 packages of plants, 37 packages of seeds, 9 packages of trees, and 487 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 9 packages of trees and 6 empty wine casks were fumigated. Under the Federal Commerce Act, 1,446bush. of citrus fruits, 9,867 packages of dried fruit, 404 packages of jam, and 1 package of plants were exported to overseas markets. These were consigned as follows:—For London, 3 packages of citrus fruit, 8,602 packages of dried fruit, 404 packages of jam; for South Africa, 240 packages of dried fruit; for China, 10 packages of dried fruit; for New Zealand, 1,443 packages of citrus fruit and 915 packages of dried fruit; for India, 100 packages of dried fruit and 1 package of plants. Under the Federal Quarantine Act, 1,872 packages of seeds, &c., were examined and admitted from overseas sources.



Wheaten Hay on the Government Experimental Farm Minnaba: estimated to yield over 3 tons to the acre.



The Yarwondutta Rocks, Minniba, which afford water catchment for the Government Experimental Farm.
Note the dwarf wall around the base of the rock, and tank to the right of the picture.

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* No report received during the month of October.

† Formal report only received.

‡ Held over until next month.

§ Report of Congress received.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

MORCHARD (Average annual rainfall, 13.50in.).

August 28th.—Present: 16 members.

SHEEP ON THE FARM.—Mr. G. Gregory, who contributed a short paper on this subject, thought the Merino wether was the most profitable class of sheep for the average farmer to keep. If a good class of stock was kept no difficulty would be found in disposing of the sheep at a profitable figure. They could be run on the fallow, and materially assist in keeping the weeds in check. If ewes and lambs were handled, they had to be guarded from the ravages of the foxes, and in addition to that one had to keep on hand a reserve supply of fodder for hand feeding should such an occasion present itself.

TARCOWIE (Average annual rainfall, 15½in.).

September 28th.—Present: 14 members and two visitors.

CARE OF FOALS.—In a short paper dealing with this subject, Mr. D. Smith said as the time for foaling approached the mare should be placed in a clean grass paddock. If the mare was allowed to foal in the stable it frequently happened that the foal contracted an illness or disease, caused very often by germs getting into its body through the navel. If the navel cord did not break when the foal was dropped it should be cut and tied with a piece of string, and if the foal did not suck its mother a few hours after it had been foaled, an attempt should be made to encourage it to take a drink. If the mare had to take her place in the team, the foal should not be allowed to follow in the paddock, neither should the foal be allowed to suckle its mother if she came out of the team in a sweated condition. When it became necessary to wean the foal and there was not a good paddock of feed available he suggested hand feeding it, with a liberal allowance of bran and good chaff. Salt licks were also recommended. The water trough should be placed at the far end of the stall or yard so that the foals could not take a mouthful of chaff and then a drink of water. One very important point was to see that the yard was thoroughly disinfected to keep flies in check, as they were responsible for many diseases contracted by the foals. After the foals had been shut up for some time they should be turned into a paddock of good feed. An interesting discussion followed, and it was generally agreed that it was best to keep the foals at some distance from the stables. Members also upheld the writer's opinion that it was important to keep the yards as clean as possible.

FENCING.—Mr. E. Harvie, who contributed a short paper dealing with this subject, said the first fence that should be erected was the one enclosing the whole farm. Posts, 6in. by 4in. at the smaller end, should be used and sunk into the ground to a depth of about 22in. The strainers should be 18in. in thickness and 7ft. in length, and placed 9 chains or 10 chains apart. One end of the strut should be bedded 8in. into the soil and the other let into the side of the strainer. For wiring he recommended a barb on top with five plain wires underneath. With the aid of a fencing tool that enabled one to strain the wires between the posts a considerable saving of time would be effected when repairing fences.

WARCOWIE (Average annual rainfall, 12.16in.).

August 25th.—Present: eight members.

ANNUAL MEETING.—The Hon. Secretary, Mr. J. J. Jones, presented the annual report, and the officers were elected for the ensuing year. A short paper was read by Mr. A. Crossman, "Motor Cars and Other Engines on the Farm," in which he pointed out the many useful and time-saving jobs that the engine would perform. Mr. G. Growden mentioned that he had hired a Holstein bull from the Department of Agriculture, and advised members to avail themselves of the opportunity of securing the services of a pure blooded animal for the purpose of building up the standard of their herds.

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

September 22nd.—Present: 13 members and three visitors.

SPRAYING.—The Hon. Secretary (Mr. J. Burton) read the following paper:—
 "The outfit for spraying will depend entirely on the amount and character of the work that is to be performed. Numerous pumps are made for special work of spraying, but a pump simple in construction is to be preferred. No one outfit can be expected to suit all the varying conditions of spraying, but a hand pump should give great pressure with the least expenditure of power. All working parts should be made of brass, and so constructed that the pump can easily be taken to pieces. Power pumps are coming into more general use, as they are more economical and do better work than the hand pumps. Nothing contributes more to success in spraying than a good hose and nozzles. Half-inch hose is generally used. Good three or four ply material should be bought, for it never pays to use a cheap hose in spraying. At least 25ft. to 30ft. of hose should be used. The couplings should be of a style readily adjusted, and everything must be kept tight to withstand the pressure. Spraying trees is looked upon by all progressive fruitgrowers as compulsory. There are still, however, a number of growers who have not realised the importance of this feature of the work, and a certain percentage of fruit is lost annually, much of which, by the timely application of a spray, could no doubt have been saved. Diseases may not occur every year, but experience has shown that they recur frequently, and, in years of their appearance, the profits from spraying are so great that the grower can afford to spray regularly. The following are four operations upon which all permanent success in fruit culture largely depends:—Cultivation, manuring, pruning, and spraying. Spraying is not the least important. In the treatment of pests and diseases the principle point is what remedy to use. Then comes the point of applying it. The fruitgrower must identify the cause of his trouble, because as a rule insecticides are of no use against fungous diseases, and, *vice versa*, there is no doubt that the annual winter dressing of Bordeaux mixture is of very great benefit to the trees, for most growers know the great loss caused by injurious insects and fungous diseases, and it is known that this loss can be prevented by intelligent effort. Spraying pays for itself in the increased market price obtained for the fruit. Thorough spraying means the use of a good spray pump, and outfit, and a knowledge of the enemies to be treated, and of the remedies found to be most effective; their preparation, and the proper time for the application. Prevention of fungous diseases is possible, but their cure is hardly practicable. When failure occurs it may generally be attributed to lateness, carelessness in mixing, or manner of application. The spray must actually reach every point which it is intended to protect. One of the greatest drawbacks in combating any orchard pest is the ineffective way in which the spray is applied. Growers are too apt to rush over their trees, thus missing many parts of them with the spray, which form good breeding grounds for the insect. For fungoid diseases Bordeaux mixture and lime sulphur solution are generally used. Thus, if a fungicide is applied in early spring most of such plant diseases may be held in check. A fungicide is a preventive, and its application should begin long before the disease. For leaf-eating insects,

arsenate of lead is the standard remedy. Some of these insects eat the leaves, while others suck the plant juices. The orchardist must know to which of these two classes a particular insect belongs in order to know what remedy to apply. Insects which chew their food are the codlin moth and vine caterpillar. These insects can be destroyed by a poison which kills the insects when taken into the stomach along with particles of food. We apply this class of insecticide to the plants, making no effort to apply it directly to the insects. To keep codlin moth in check, four sprayings are necessary, especially for late varieties or large-growing apples. Scale insects must be killed by a contact insecticide applied directly upon them, which will kill them by penetration and irritation. The following remedies have proved successful for these insects:—Kerosine emulsion, tobacco solution, prepared red spraying oil. Hydrocyanic acid gas is also used, and has proved most efficient."

Mr. A. H. Clogg then read a short paper, "Farm Book-keeping," in which he told of the many advantages that accrued from a system of farm book-keeping.

GLADSTONE (Average annual rainfall, 16in.).

September 25th.—Present: 12 members.

The delegates to the Adelaide Congress (Messrs. R. H. Coe and L. J. Sargeant) gave an interesting resume of the proceedings. Mr. J. Fisher then read a paper entitled "Farm Fences." Fences, he said, should be kept in good repair, wires tightened, and mended as soon as breakages were noticed. Broken posts and wires had a tendency to make rogues of sheep and cattle, because the animals would soon get into the habit of endeavoring to get through the fence. He would recommend a fence consisting of, say, one wooden post and two iron standards spaced about 10ft. apart, with five wires and a barbed wire on top. That fence would be strong, and was more cheaply erected than one of all wooden posts. Another style, and also a cheaper one to erect, was composed of two posts with an iron standard in the centre, and a dropper between the iron standard and the post on either side. That fence was not so firm, but he recommended it for subdividing the farm. A fence of all iron standards and droppers was cheaply erected, and although not very firm, was a useful fence in sheep country, and there was no danger of its being destroyed by grass fires. He did not favor hedges as farm fences, because they harbored sparrows and rabbits, and if a post and wire fence was included in the hedge it was by no means an easy job to repair it, especially if the hedge was of a prickly nature. Horses, he said, were very careful how they treated a barb wire fence, but that was not so with a plain wire fence. He thought it was advisable for farmers to plant trees in the corners of their paddocks, and in any waste land, say along creeks, because they would be useful for posts in years to come. In the absence of wooden posts, he thought a cement reinforced concrete post would be a good substitute. A good discussion followed the reading of this paper.

NORTH BOOBOROWIE (Average annual rainfall, 16.35in.).

September 30th.—Present: nine members and visitors.

SHEEP BREEDING ON THE FARM.—The following paper was contributed by Mr. W. E. Hannaford:—"When a farmer has decided to keep sheep on his farm the first thing to do is to see to the water supply. If possible, it should be arranged to have water in every paddock, because the sheep do much better when water is always available. By having a race, one can often arrange for several paddocks to open into it, and with a trough in the race, several paddocks can be watered with the one trough. It is also essential to see that you have sufficient feed for the number of stock to be carried. It is far better to understock than overstock. A farmer must be prepared to tide over a bad time by hand feeding. It is also advisable to provide some kind of salt lick; this helps to keep the digestive organs in good order and will probably reduce the number of deaths from bloat when sheep are grazed on lucerne. I have no hesitation in saying a strong-woolled, robust Merino is the most suitable sheep for our district. Merino wethers, produced on stations which our holdings once formed a part, were noted for their size, quality, and valuable fleeces. There are many different strains of Merinos, but for the purposes of

breeding, ewes that will give the best return for wool and at the same time produce a lamb suitable for the freezer or that will grow into a profitable sheep, we cannot do better than the large-framed, plain-bodied, strong-woolled, sound-constituted sheep for which South Australia has long been noted. I would recommend the farmer to go to a breeder producing sheep nearest to his ideal and from him secure the foundation of his flock. The ewes should be plain bodied with fairly plain necks, good open faces; big, roomy sheep carrying a strong, bold, profitable fleece. The rams should carry a little more development, with good strong horns, open face, and a fleece similar to the ewes. They should be shorn about the end of September and dipped in an arsenical dip as soon as the cuts have healed. The rams should be put with the ewes about the middle of October. About the end of February the ewes should be carefully yarded, crutched, and some dip (double strength) swabbed around the crutch to prevent the maggots making headway should the ewes be struck by flies. While the ewes are lambing they should be watched closely to see that none get cast or in need of assistance. When the lambs are about a month old they should be marked. The general practice is to use a knife for the operation. I find by taking the tail off at the second joint (after a little practice the joint is fairly easily found), having a hot iron at hand, you can sear the main vein just below the bone, thus saving the lamb from considerable loss of blood, and the searing takes very little time. A private earmark should be made with a pair of ear-pliers on one ear, and an age mark on the opposite ear. For the age mark one could use:—First year, one front notch; second year, two front notches; third year, one back notch; fourth year, two back notches; fifth year, point of ear. When the lambs are five months old, if they and their mothers have been provided with the feed they should have had, the lamb should be fit for market. I would strongly advise the farmer on no account to part with the best of his ewe lambs. If you have a market near it will pay to take of the most forward of the wether lambs and dispose of them, thus giving the backward lambs a chance to come on. The second year the ewe lambs saved will be ready to take their place in the breeding flock, and if you are fully stocked, room must be made for them. Go through your breeding flock and cut out the necessary number, especially all those who have not proved themselves good mothers. You will now need a ram or rams for these young ewes, and this is where many farmers, to my idea, go astray. They think, for reasons which they are unable to explain, that by bringing in different blood to that on which their flock is founded they might make an improvement. If you do that you can never have a uniform flock. My advice is, go to the breeder from whom you secured the foundations of your flock and from him purchase the rams you require."

PORT GERMEIN (Average annual rainfall, 12.84in.).

September 4th.

NOXIOUS WEEDS.—In a short paper dealing with the question, "Destruction of Noxious Weeds," Mr. J. Hackett said noxious weeds were a source of constant and recurring expense, and a definite method of destruction should be agreed upon and carried out. One method of totally eradicating the weeds was to burn the plants on a fire of sufficient size and heat to destroy the whole of the plant. The plants could also be hoed before going to seed, but he realised that that was a very costly and laborious undertaking. If any measure of success was to be obtained in the destruction of the weeds, it would be necessary for every individual farmer to co-ordinate and perform the work at the same time.

WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

September 5th.—Present: nine members.

CARE AND MANAGEMENT OF THE HORSE.—In the course of a paper under the heading, "The Horse on the Farm, its Future, Care and Management," Mr. J. Walsh said that in dealing with the horse in its relation to its sphere of usefulness on the farm, one should not lose sight of the fact that in the future the farm horse would have to compete with all the best methods of mechanical traction. It was predicted by many tractor enthusiasts that in the course of a

decade, that that means of propulsion would oust the horse from his prominent position on the farm. His opinion, however, was that when the subject was considered from all view points, the horse might be superseded by tractor, lorry, and car in some branches of agriculture, but for some time to come they would form a very important part of the farmers' working equipment. He believed the time was not very far distant when it would only pay to keep the very best horses. It was very often stated that many of the farmers in the future would devote more time to stockraising than wheat growing, yet even if that was done the farmer would need to keep a fair number of horses on the farm, because, if stockraising was taken up, it would still be necessary to do a large amount of hand feeding, and to do that successfully large stocks of fodder would have to be conserved, which meant a considerable cultivation of the soil. After the farmer had decided on the class of horse best suited for his needs, he should endeavor to build the team up with animals of a uniform size. If they were going to get the best results from the horses it was important that provision should be made for an abundant supply of feed and water. Speaking of the feeding system, the writer said it was his practice to feed and water animals first thing in the morning, and then groom them with the brush and curry comb. After breakfast, the collars and shoulders of the horses were carefully cleaned. During seeding and fallowing the team was fed in nosebags for the mid-day meal. If the hay contained a large amount of grain he simply gave each horse two kerosine tins full of chaff with two handfuls of bran. If the weather was warm he usually damped the chaff. If, on the other hand, the chaff did not contain very much grain, he added five handfuls of oats and two of crushed wheat or bran. If the weather was very hot and the team came home from the field in a sweated condition he always washed their shoulders with cold water, which was a good preventive of sores and scalded shoulders. He then fed the team with sufficient chaffed hay to last them all night. The only occasion on which the animals were given long hay was on Saturday night, when they would have plenty of time to eat it all. If one had a good grass paddock the horses could be turned into it after tea on Saturday. It was not always possible to prevent the horses from getting sore shoulders. If a horse was inclined to get sore shoulders easily he always examined the collar; and if the sore was caused through faulty stuffing, the cord holding the lining to the leather should be cut and some of the hair taken away, thus easing the pressure on the affected part of the shoulder. Another good plan was to get two old stockings, fill them with properly "teased" hair, and place them one below and one above the sore. That would take the weight of the collar off the sore and give it a chance to heal. Good collars should be purchased, and each horse worked in his own set of harness. The farmer could also economise and help to keep the horses comfortable by keeping all the harnesses in good repair and well oiled. *Handling the Team.*—If possible he preferred each man to work one particular team of horses, for there was no doubt that the animals worked much better when they were accustomed to the same teamster. The driver should treat the team kindly, but firmly; if a horse refused to take his share he should be sharply corrected. If one wished to get the maximum results from the team the following points should be observed:—Study the characteristic of each horse, thereby enabling you to get the best results from the team. Always give the team a short rest about 10 o'clock in the morning and 4 o'clock in the afternoon. If the weather is hot and the team is sweating freely, lift the collars on to their necks to let the fresh air play on their shoulders. Wash your horses' shoulders when you unyoke at night. Do not fail to thoroughly groom the horses' shoulders. If time cannot be given to grooming, provide sand bed for rolling. Feed your horses well, drive them at a steady pace, and they will finish the season's work in good condition. When turning corners always keep both reins tight to prevent the horses from treading on one another's feet. Speaking of the handling of young horses, the writer said that mouthing was a very important part of the work. If the colt was at all sluggish the mouthing tackle should be used and the animal driven around for an hour or so every day for a week. If the young horse was wild and vicious he suggested throwing it on a soft yard, and after its legs had been tied together, it could be rubbed all over the body and rolled from side to side.

YACKA.

August 24th.—Present: 20 members.

BREEDING HORSES.—"The first point to be acquired in the successful breeding of horses is a knowledge of the points that constitute the different qualities of the animals." Such were the opening remarks of a member in a paper "Breeding and Rearing Horses." The pairing of the sexes should have a strict reference to correcting the imperfections of one parent by a corresponding excellence in the other. In breeding the stock up to a high standard one should see that the sire was of the purest blood and characteristics of the breed. Cross-breeding was not always objectionable, but violent crosses should be avoided.

GLADSTONE, September 4th.—Mr. J. Eley contributed a paper entitled "The Future of the Motor Truck," and a good discussion followed.

MUNDOORA, September 27th.—The subject "Motor Tractor *versus* the Horse" was brought forward for discussion, when it was generally agreed that up to the present time the cost of working the tractor was too expensive for most farmers. The matter of the continuation of the Wheat Pool was also brought forward. Mr. Clothier said he had had no objection to the Wheat Pool during the past years, but now that they were approaching normal conditions he thought the wheat market should be an open one. Some members were of the opinion that it would be best to have a voluntary Wheat Pool as well as the merchants, but the consensus of opinion was that the time was at hand when the control of the wheat should be out of the hands of the Government.

REDHILL, September 28th.—The report of the delegates to the Annual Congress was received; and the meeting discussed the subject "Useful Hints for the Farmer."

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)
LONE PINE.

September 21st.—Present: 19 members.

THE FARM VEGETABLE GARDEN.—The Hon. Secretary (Mr. T. Fromm), who contributed a paper on this subject, said the land chosen for the garden should be dressed with stable manure before the soil was broken up. After the ploughing was completed, cultivation was necessary to destroy the weeds and conserve moisture. In addition to the stable manure he thought the returns would be increased by an application of about 3cwt. to 5cwt. of bone super. Good seed, and the time and manner of sowing, were three points that should be considered. If the plot was irrigated he thought it was best to give the plants a thorough soaking about once a fortnight. The delegates to the Annual Congress then gave a concise report of the proceedings of the various sessions.

SADDLEWORTH (WOMEN'S), August 30th.—Mr. D. F. Laurie (Government Poultry Expert) gave an interesting address on the feeding, rearing, and housing of poultry. At a subsequent meeting held on September 7th Mrs. Coleman contributed a paper entitled "Dairying." The writer recommended the Jersey breed. The Jersey was a small animal, but a heavy milker. The average cow should give 2½ galls. of rich milk per day and 10lbs. of butter per week. During the winter barley and hay chaff or cocky chaff with scalded copra cake and bran could be fed. Lucerne was the best summer feed.

WATERVALE, August 23rd.—A member read an article from the *Journal of Agriculture*, and an interesting discussion followed.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

KADINA (Average annual rainfall, 15.88in.).

September 3rd.—Present: eight members.

SHEEP ON SMALL HOLDINGS.—Mr. W. T. Correll, who contributed a paper on this subject, said by the term "small holdings" he meant a farm comprising up to 1,000 acres. There were two methods of keeping the sheep open to the farmer

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with a small holding. One was to purchase stores and fatten them for market, the other to keep a flock of ewes and breed lambs and market the wool. He preferred the latter practice. When one secured store sheep they were as a rule station bred animals, and it was, therefore, some little time before they became thoroughly acclimatised. He preferred a plain Merino ewe with not too much wool on the face and legs, because of the prevalence of burrs and grass seeds in their district. If the farmer desired to raise cross-bred lambs he recommended using a Border-Leicester or Shropshire ram. If a Merino ram was used one could keep adding to the ewes in the flock and dispose of the wethers and old ewes. The rams should be mated about January 1st and taken out again during the first week in February, so that the lambing season would not be drawn over too long a period. May and June were the best months of the year for the ewes to lamb in that district, because before that time there was not very much green feed obtainable. He advised crutching the ewes about six or eight weeks before lambing; and suggested a close inspection of the ewes during the lambing season. At that particular time of the year one should not miss the opportunity of laying poison baits for foxes. When the lambs were from six to eight weeks old marking operations should be carried out, preferably in the morning to give the lambs a chance to recover from the shock before the cold night set in. If one noticed any weedy lamb it could be taken that its mother did not have a very good supply of milk, and she should be culled and sold to the butcher. Dipping should be done about a month after shearing, as one did not require so much dip, and the ewes went through the ordeal much better than when they had more wool on their backs.

KILKERRAN.

August 26th.—Present: 13 members and two visitors.

MANAGEMENT OF FARM HORSES.—In the course of a paper dealing with this subject Mr. J. A. Allen said feeding was one of the most important points in the management of the farm team. He believed that the best class of feed for a hard working team was a mixture of wheats and oatmeal chaff. The wheaten hay should be cut a little on the green side, but for the oatmeal hay he thought it was the best to allow the crop to become fairly ripe before it was cut. The animals should be fed at regular intervals, and not over driven during the day's work. An occasional inspection of the shoulders of the team while they were having a spell was a good plan. In the discussion that followed Messrs. B. Kock and A. Wakefield thought it was best to cut the wheaten hay a little later than was advised by the speaker. If the hay was cut too green they believed it would scour the horses. Mr. T. Geater advised leaving the horses loose in the yard, and making ample provision for shelter from the sun and cold winds. Mr. F. Francis considered that the team should not be worked longer than eight hours a day. They should also be allowed one and a half hours for dinner, when all harness should be removed. The majority of members did not agree with the latter statement, because if one were working a team of 10 or 12 horses the harnessing up would take too long. Messrs. Cogan, Welden, and Gregory also spoke.

KILKERRAN.

September 23rd.—Present: 10 members and visitors.

THE BLACKSMITH SHOP.—In the course of a short paper dealing with this subject, Mr. A. J. Cogan said every farmer that lived a fair distance from the township should have a blacksmith shop on his farm. He considered that no farm was complete without a smithy, for, with a little practice, one could do a great portion of the repairs to the implements. The speaker pointed out that it was not so much a question of the cost of the job as the time that was spent in going to and from the town. Then again, when the weather was too wet to permit of work being done in the paddock, the time could be spent very profitably in the blacksmith shop making hooks, &c., and doing repairs.

MOONTA (Average annual rainfall 15.22in.)

August 28th.—Present: 21 members and visitors.

HANDFEEDING SHEEP.—Mr. T. H. Hooper, who contributed a paper dealing with this question, expressed the opinion that if more attention was paid to handfeeding the sheep during the autumn and winter months of the year the farmers and the State as a whole would reap considerable benefit. The writer mentioned the good results that had been obtained at Roseworthy Agricultural College by handfeeding the sheep with a mixture of chaffed hay, crushed oats, and molasses, but he believed such a practice could only be carried out by the farmer who had a number of sons working on his property, and was not compelled to employ outside labor. He believed it to be a very wasteful method to feed sheep on chaff that had not first been damped, because a considerable quantity of it was blown away by the wind. He had personally tried feeding the animals on long hay, but that also was wasteful, as the sheep trod so much of the fodder underfoot. He was of the opinion that the best and cheapest plan was to make use of the stubble that, under ordinary circumstances, was never used on the farm. He suggested stacking the straw into small stacks and fencing each one separately, so that the stock would not have access to every stack at the same time. By sprinkling the straw with fine crude salt he believed its keeping qualities would be considerably enhanced. Salt licks should also be provided. These could be kept in wooden troughs under a shed to protect them from the rain. The oats, when harvested, should be stored in a silo, so constructed that grain would run into a dray or trolley fitted out for the purpose, and automatic grain feeders could be placed near the straw stack. If those plans were carried out he was convinced that the farmer would be able to feed his sheep at a very small cost, and at the same time he would be able to carry an even flock through the whole of the year. Mr. H. J. Cadd, who opened the discussion, favored the practice of stacking good clean straw and chaffing it for the cattle and sheep when feed was scarce. Mr. C. H. Martin agreed that handfeeding of sheep should be more generally adopted by the farmers, particularly during lean seasons. Mr. A. B. Ferguson said each farmer should consider whether the hay that he had conserved for seasons of drought was more valuable than the sheep. He favored conserving the good straw in stacks, and if it was sprinkled with salt both cattle and sheep would eat it readily. Oats could be easily hand fed to sheep, for one simply had to throw them on the ground and the stock would pick them up. Mr. C. Cooper said a sheep could be fattened on 1lb. of chaff per day, and he believed that was a better paying proposition than selling the hay for £5 or £6 per ton. He favored mixing oil cake with the chaffed straw. Mr. Middleton had tried feeding his sheep on copra cake, bran, and oats, but that did not pay so well as letting the sheep have the run of the paddocks.

ARTHURTON, September 29th.—The Chairman (Mr. W. Short) tabled specimens of larva obtained from the horns and nasal bone of a young wether. Mr. Williams stated that he was conducting experiments with flax, and at a later date hoped to place samples of the crop before the Branch.

MAITLAND, October 2nd.—Mr. J. C. Price delivered an address on the "Bulk Handling of Wheat."

PASKEVILLE, September 28th.—Mr. J. C. Price gave a short address. The report of the delegates to the Annual Congress was also received and discussed.

WESTERN DISTRICT.

BIG SWAMP.

September 23rd.—Present: eight members and visitors.

STACK BUILDING.—In a short address on this subject, Mr. C. Venning said the stack should be erected with the ends facing north and south in order to allow the sun to shine on both sides of the roof. Logs, stones, or stumps should be laid out as dunnage, and a high post set in the ground at each corner to serve as a guide when the stack was being built. He did not think it advisable to make the stack more than 6ft. wide. By building the sides perpendicular they would receive the desired inclination as the sheaves settled down. After

experience in building the stack in different ways, he favored placing all the huts outwards with, of course, the exception of the corner sheaves. When the eaves were reached the outside ring of sheaves should be allowed to project 6in. over the walls of the stack.

LAKE WANGARY.

September 25th.—Present: 12 members and visitors.

MOST PROFITABLE SHEEP FOR THE DISTRICT.—In a short paper under this heading, Mr. A. Puckridge said that after 35 years' experience with many different breeds of sheep he had come to the conclusion that the Merino was the type of sheep best suited to the conditions of their district. He did not favor from breeding from locally bred rams, because after the sheep had been kept for a few years under their conditions the wool had a tendency to become too fine and silky. If rams were secured from one of the reliable mid-northern breeders, and the poorer class of ewes culled out of their flocks, the farmers would soon notice a good increase in their wool clip. A good discussion followed.

MILTALIE (Average annual rainfall, 14.55in.).

August 28th.—Present: eight members and one visitor.

HOMESTEAD MEETING.—The monthly meeting of the Branch was held at the residence of Mr. J. P. Story, when Mr. H. R. Jacobs contributed a paper entitled "Marketing Our Produce." Considering the high cost of material and the amount of labor that was required to produce it, it was surprising the little interest that was taken in the marketing of the same, he said, and proceeded to deal with the different products of the district, and improvements that could be made in the preparing and marketing of the same. A good discussion followed, in the course of which Messrs. A. M. Wilson, J. P. Story, J. S. Jacobs, and O. Degner took part.

MOUNT HOPE.

September 25th.—Present: seven members and three visitors.

BY-PRODUCTS OF THE FARM.—Mr. H. F. Myers contributed a paper entitled "Some By-Products of the Farm." Farmers on Eyre Peninsula, he said, paid little attention to products other than wheat or wool, because a reasonable market was not available. Produce had to be railed to Port Lincoln, and then shipped to Port Adelaide. He was of the opinion that in the near future a ready market would be available for perishable produce, such as eggs, butter, bacon, and fat stock at Port Lincoln. In commencing with the poultry yard, he said care should be taken to provide a large yard with three heights of netting around. A good fowlhouse should be built so that the fowls could have shelter from the weather and they could be protected at night from foxes. Plenty of grit and clean water should be provided. The majority of the farmers had plenty of screenings left over from harvest, so there should be no trouble in providing food. Fowls were also very fond of green stuff. A great number of people favored the White Leghorn breed, but, because they were purely a laying strain, he preferred another breed such as the Plymouth Rock, birds of which breed, he thought, were also good layers. If every farmer had three or four cows they should be profitable, especially if the farmers systematically looked after them. If at all practicable a patch of lucerne should be grown on the farm to provide a sufficiency of green feed. The yards and milking shed should be kept clean. Shorthorns, he thought, were a good all-round breed for milk and beef in that district. He was of the opinion that if there was a dairy on the farm there should also be a piggery. There was always plenty of milk from the dairy which could be fed to the pigs. Pigs should be kept in a substantial sty, preferably on a slope, with a fairly large yard. Bedding of dry straw should be provided and renewed frequently, especially during the winter months. A good discussion followed the reading of the paper.

SMOKY BAY (Average annual rainfall, 13.06in.).

September 25th.—Present: 16 members.

The delegates to the Adelaide Congress (Messrs. F. Gregor and G. Crocker) gave an interesting account of the proceedings.


GALVANIZED IRON.—At a meeting held on August 28th Mr. H. W. Tremaine read a paper entitled "Galvanized Iron." The shortage of water for stock was a vital question to farmers on the West Coast, he said. Parts of the country

were of a sandy nature, and consequently dams were of no use, because they would not hold the water. That shortage could be overcome by galvanized-iron catchments, but to acquire that, assistance from the Government would be required. Galvanized iron, he said, should be available to farmers in the dry areas on easy terms, and at the lowest price. It should be supplied in quantities of not more than five tons per farmer, and only supplied as the farmer could erect on sheds or permanent structures at the approval of the Government. Five tons of iron would catch, on a 12in. rainfall, 65,000galls.—quite enough for the average farm. If it was erected on sheds it would be useful for catching water, which was of the utmost importance; as a shelter for implements against the weather; and also for storing feed in time of drought, which was so necessary in that district. In the dry areas the rain did not fall heavy enough to run off the ground, but iron would catch every drop. He then stated that he had been on his farm seven years, and had put down six tanks, but only two had ever been full. One of those had an iron catchment and the other a rock catchment. Large tanks, he said, were a failure in that district, because they benefited the farmers in their immediate neighborhood only, who, in many cases, kept a number of young stock on them. A good discussion followed.

WUDINNA.

September 2nd.—Present: 10 members and visitors.

THE FARM ORCHARD AND GARDEN.—In a paper under the heading, "The Planting and General Management of an Orchard and Vegetable Garden on the Farm," Mr. F. L. Johnson said, for a garden in that locality, he would select a piece




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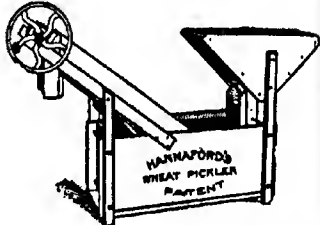
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of land of a rich loamy character, with a depth of about 18in. or 2ft. of soil, with a subsoil of limestone rubble. The first aim should be to clear the land of all stumps and roots, and then work the plot with a single furrow plough to a depth of about 12in. Next, the land should be thoroughly harrowed and sown with wheat or barley for green feed. That plan could be carried out for two seasons. He did not favor planting trees on new land, because of the prevalence of white ants. A good substantial vermin-proof fence should then be erected. After the land had been pegged out, holes about a foot deep should be dug for the trees. When planting he preferred to form a small mound of stable manure and super in the bottom of the hole for the roots of the tree to rest upon. Before the tree was placed in position all broken roots should be removed with a sharp knife. The holes could then be filled in and the tree given a good watering. Young trees usually required to be cut back to three or four buds the first pruning season. Should any disease or insects make their appearance on the trees, spraying should be resorted to. For breakwinds the speaker suggested olives or almonds. After the land had been cultivated it was a good plan to spread old manure or straw around the trees to keep the soil in a moist condition during the summer months. He pointed out the need for exercising care when working between the rows of trees, so that the roots would not be injured in any way by the implements. He believed it would be a great benefit to the trees to scatter about 2½wt. of super between the rows during October, and then run the harrows over the land. For the vegetable garden a rich, deep loamy soil was required. All stumps should, of course, be removed, and the plot given a good dressing of stable manure. For cabbages and cauliflowers fresh manure could be used, and the root crops could be planted on the same piece of land that had carried the cabbages, &c., without an additional dressing of manure. Cabbages should be planted 20in. apart and cauliflowers 24in. Most of the seed of the other vegetables should be thinly sown on well prepared beds. For swedes, turnips, and beets he suggested transplanting at a distance of 6in. apart, and 9in. between the rows. Onion seed should be soaked for about 12hrs. before planting, because under ordinary conditions they germinated very slowly. A list of suitable varieties of carrots, onions, swedes, &c., then followed. Speaking of potato growing, the writer said the land should be prepared at least three months before sowing the seed. It should be worked to a depth of 12in. and then harrowed. He suggested working the land with a plough, and in every fourth furrow the sets could be placed out 15in. apart. Hoeing should be carried out until the plants were at least 6in. above the ground. Pumpkins, marrows, &c., could be grown by digging a hole 12ft. long, 4ft. wide, and 3ft. deep. The trench should then be filled in with 1ft. of well-decomposed stable manure and 6in. of good soil. That should be thoroughly stirred up and then tramped down. The other half should then be filled in, in the same manner as mentioned above, and the trench given a good watering. Such a trench would carry about 10 plants, and if they were properly cared for one should have an abundant supply of vegetables. Tomatoes, cucumbers, water and sweet melons could also be planted in a trench in the same manner.

YADNARIE (Average annual rainfall, 14.09in.).

September 22nd.—Present—nine members.

PREPARING SMALL CLIPS FOR MARKET.—Mr. J. H. Kruger, who contributed a paper on this subject, said the shed set aside for the shearing should be thoroughly cleaned of all chaff and other rubbish likely to affect the value of the wool. The pens should be provided with gratings in order that the sheep would not become wet and dirty when waiting to be shorn. For making the gratings he suggested using lin. by 1½in. stringy bark placed ½in. apart and nailed to 5in. by 1½in. jarrah. The shearing stand should be boarded, and a space of about 6ft. square allowed for each shearer. Both the board and gratings should be so arranged that they could be easily removed should one desire to use the shed for any other purpose. Provision should be made for a good ventilation and daylight, but at the same time one should take care to keep the draught off the men shearing the sheep. The entrance to the catching pen should be in the centre, and between the shearers, with the board adjoining the pen. The writer suggested that the wool

table should be erected near the board, with battens properly planed off to prevent the fleece from catching in the wood. If the table was made 8ft. by 5ft. it would give plenty of room to allow the fleece to be properly handled. Speaking of the skirting and classing of the clip, he said much depended on the condition of the fleece, but if the wool was reasonably clean the stained and dirty edges of the fleece need only be removed. Each fleece should be carefully rolled, with the neck piece folded back, but the rolling should be commenced from the tail. In his opinion nothing was gained by keeping the belly wool separate, provided it was free from burrs, and compared favorably with the fleece. All wet pieces should be dried before baling, the best parts being classed as pieces and the remainder as locks. For small lots he did not think it was necessary to make more than two classes. The wool should be neatly baled, and each parcel neatly and distinctly branded as to the class of wool it contained. For that purpose he recommended making stencil plates from a piece of tin or flat galvanized iron. An interesting discussion followed, in which Messrs. Hier, Jericho, and Kruger took part.

YEELANNA.

October 6th.—Present: 12 members and seven visitors.

PREPARING THE WOOL CLIP.—Mr. A. L. Barns contributed a paper on this subject. Large sheep owners, he said, gave close attention to every detail in connection with shearing and the preparation of the clip for market. The mixed farmer who grazed a few hundred sheep was not in the same position. He considered that such a clip was not sufficient to warrant the employment of a wool classifier. Experience, however, showed that a little extra care, even in the classification of the small clip, would increase the return. The writer of the paper would provide housing for sufficient sheep for two days' shearing operations in the event of rain. Strict attention should be paid to the shearing to avoid second cuts, because they affected the return to the grower. The wool table should be about 9ft. or 10ft. long, 4ft. to 5ft. wide, and 3ft. high, with rollers sufficiently wide apart to allow fribs and second cuts to pass through under the table. As the fleeces were spread on the table they should be carefully shaken to remove second cuts and fribs. The skirting should be carefully done. The neck should be kept separate from the breech and other pieces. Those should be put into heaps and sorted later. When the fleece was being rolled the neck should be turned in end first about 12in., then the breech end similarly. The side of the fleece nearest the roller should then be turned in, then the opposite side, and a couple of turns made to meet the inner side. It should then be lightly rolled from breech to neck, care being taken not to twist the wool. The necks, breeches, and trimmings being in separate heaps they should then be carefully sorted, the longer and better wool being separated from the shorter and thinner growths. The best wool should be branded "first" pieces, and the shorter "second" pieces. The bellies, when delivered from the shearing board, should be sorted and the stained parts picked out, dried, and placed with the worst of the stained pieces. If there was a sufficient quantity of bellies, they should be graded first and second. For branding the wool he would suggest the following method:—"AAA," good length, quality, and condition—leading quality; "AA," fleeces, not so fine, sound, good length and condition, second quality; "A," short, thin, and sound, third quality; "B," good conditioned, weak stapled fleeces. The sex, whether hoggets, ewes, or wethers, should be stamped after the above letters. Cull fleeces, including dingy and discolored wool, should be branded "C" and kept separate. Both black wool and rams' fleeces should be packed separately in every instance, and not included with any other quality. When bales containing broken or broken fleeces were being branded care should be taken to see that quality was placed on the bale as BKN. and not B. or BFE, because that led to confusion. The same applied in the case of bellies, they should be branded BLS. and not B., that would obviate confusion and mistakes. Lambs should be branded LBS., locks LKS., Lincoln LCN., and Leicester LST. During the discussion which followed the members agreed that it was advisable to keep the best class of sheep within their means, and that the preparing of the clip in the best possible manner was a payable proposition.

KIMBA, September 27th.—The members discussed the question, "Weighing Wheat in Bulk," and the delegates to the Annual Congress tendered their report of the proceedings of the gathering. Several other matters of local importance were brought before the meeting.

EASTERN DISTRICT. (EAST OF MOUNT LOFTY RANGES.)

COONALPYN (Average annual rainfall, 17.49in.).

September 24th.—Present: five members and two visitors.

LOW GRAIN YIELDS.—The Secretary (Mr. F. J. Tregenza) contributed a paper entitled "Some Factors Responsible for Low Grain Yields." Apart from weather conditions, he said, there were, in his opinion, four factors which were responsible for the low grain yields locally. By far the most common factor was insufficient preparation of the soil. The secret of growing crops of any kind was largely in the preliminary preparation given to the soil. Grain crops were no exception to that rule, and when he spoke of fallow he meant land that was being prepared nine or 10 months before the seed was sown, and it was a matter of general experience that only by such a system of bare fallow could payable crops be grown in South Australia. He thought that the slovenly system of allowing bushes to continue growing throughout the summer on land intended for crop was the reason for the 4bush. to 7bush. crops of wheat from that district. All bushes should be knocked off with a grubber before the summer commenced. Sheep, he said, were indispensable for ideal fallow in such a season as the present. To have the fallow bare should be their one aim, and to make and keep it bare a cultivator would be required, but before that implement could be used all bushes and roots would have to be cleared from the land. He advised carting off the roots and burning the rubbish just before drilling in June. One should aim at getting the preparation done before harvest. When the time came for sowing the grain the land should be so far ready as to need nothing more than a final stir with a big acreage cultivator. The matter of being too late in sowing the seed would largely be remedied by early preparation. He was convinced that, on the whole, they were losing by not getting the seed in earlier. Apart from the fact that the plant had not the proper time to develop itself if sown late, it had been his experience that the grain got into the ground far better in the early months, and there was less risk of delays through wet weather. The seed could be sown heavier on some of the cleared land; 60lbs. of wheat or 60lbs. of oats, with lowt. of super, would give a greater profit than 40lbs. of wheat or oats and 70lbs. of super. The farmer should see that the implements he used were the best he could afford, and that they were working as effectively as he could make them. During the discussion which followed Mr. Cavanagh did not agree with the practice of cutting bushes in early summer; he would eradicate them with the cultivating implements. He said one had to consider the season as to the time of sowing; he did not favor a set practice of early dry sowing. Mr. Angel considered that 45lbs. of wheat—the usual rate of sowing—was quite enough. Mr. Wall would cultivate the bushes off in preference to knocking them off by grubber. He believed before-harvest cultivations of fallow were far more effective than after-harvest workings.

KINGSTON-ON-MURRAY.

Present: 10 members and visitors.

RURAL FINANCE.—This subject formed the title of a paper by Mr. E. W. Chaston, who mentioned that with the tendency for the number of small land-holders to increase, the question of rural finance would need to receive earnest consideration. Ninety per cent. of the irrigation holdings on the Murray, he said, had been allotted to men who were not possessed of sufficient capital to bring their holdings into bearing within the shortest time with the least expenditure of labor. The sources from which the settlers could obtain loans were the Irrigation Department (which would lend up to £15 per acre for grubbing,

clearing, channelling, &c.), the Advances to Settlers Board (which might increase the loan up to £650), private banks, and packing houses. However, the irrigationist found it a difficult matter to raise capital, notwithstanding these sources. He suggested the formation of rural credit societies, or agricultural banks. Into these the savings of the producer should be placed. The institutions could be managed by trustees, having local experience and first-hand knowledge of the borrower. Co-operative house building societies could be formed, and in that connection the State could be expected to lend pound for pound supplied by the society. If the society were prepared to lend £400, say, on a second mortgage, the State would lend another £400 on a first mortgage. At the end of the season numerous irrigationists found themselves with sufficient to carry them through another year and a few pounds over. What a pity it was that these few pounds over could not be paid as an instalment of principal and interest off the cost of a more comfortable home. In the discussion which followed, Mr. W. Forgie asked "How would the banks be capitalised, if all were borrowers and there were no lenders?" Mr. W. Farley and Mr. F. Setterberg pointed out that the erection of a good house on a block did not increase its value proportionately, and that the house a man lived in was no indication of his financial position. Mr. C. D. Dixon said that often men preferred a motor car to a good house. Mr. Chaston, in reply, said the banks would be capitalised by the successful assisting the struggler; by wealthy older established districts helping the new districts that were being opened up. There was sufficient money available in the country if only turned into the right channel. Admitted that the house a man lived in did not indicate his wealth, very often it indicated the measure of comfort he considered good enough for his wife and family. He knew that often a man preferred a motor car to a decent house. What he wanted to see was a man with both. The value of property was largely influenced by its location. A good house on a block surrounded by tin shacks might not increase the block's value proportionately, and on the other hand a good house on a block surrounded by other good houses might increase the selling value of the block by more than the cost of the house.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

September 25th.

Mr. B. Schenscher contributed a short paper entitled "Shearing Sheep." Shearing he said, should be commenced about the same time each year, because one would then have an opportunity of judging whether the sheep had improved or not. They should be kept as clean as possible, and the wool not allowed to grow around their eyes. If labor was employed enough sheep should be yarded for one day's shearing to prevent any delay.

RAMCO.

August 30th.—Present: 21 members and four visitors.

CONCRETE TANKS.—In the course of a paper dealing with this subject, Mr. W. Hunter said one of the best assets that an irrigation block could have was an abundant supply of water for stock and household purposes. In his opinion the best and cheapest plan was the erection of a cement concrete tank. After the levels and contour of the land had been obtained for the purpose of ascertaining the fall of the pipe track to the house, the site for the tank should be pegged out. With the aid of a buck-scoop a considerable saving of time would be effected in the excavating. If the tank was made 6ft. 6in. deep and 24ft. by 24ft. a batter of about 4ft. would be required for the walls. Before the excavating was completed 1ft. of earth should be left on both sides at the bottom, and the hole filled with water for the purpose of shrinkage and to allow for the setting of the soil. After the water had drained away the sides and bottom could then be cut down to the correct dimensions. Ten yards of 2in. gauge rubble, the same quantity of sharp river sand, and approximately two tons of cement would be required for the tank. These should be mixed in a ratio of about five of sand and rubble to one of cement, and the proportions measured with an ordinary wheel barrow. The concrete could be applied with a shovel, although a much better job could be done with the use of a frame. The finishing coat of cement should be applied as soon as possible. Mr. F. Lewis, in discussing the paper, said concrete work in their district had a tendency to crack badly, and if possible the concrete should

be reinforced with wire netting. Mr. W. Perry was of the opinion that barb wire was one of the best materials for reinforcing. Messrs. Taylor, Stanley, and Morgan also spoke.

ADOBE.—At a further meeting held on September 27th, Mr. Robertson read a paper, "Adobe." The term adobe, he said, was the name given to bricks made of a mixture of clay and straw with a proportion of sand added to prevent excessive shrinkage. Many of the ancient cities of the world had been built of adobe, and in some places, at the present day, it was the only form of building erected. The clay, straw, and sand was simply mixed until it attained the consistency of a stiff mortar. It was then placed into wooden moulds, shaped like bricks, and then placed in the sun to dry. After they had been turned several times the bricks would be ready for building purposes. The mortar used in the building, with the exception of the straw, was the same as that used for making the bricks. It was always advisable to have a protecting coat on the outside of the walls, because excessive rain tended to dissolve the clay. If tallow was covered with fresh lime and slaked, the resultant whitewash, applied twice to the walls, would make the walls absolutely waterproof. Adobe had proved the most non-conductive building material in existence, for tests showed that there was only six degrees variation between summer heat and winter cold, and the pressure test proved that the material would resist a pressure of 400lbs. to the square inch. The report of the delegates to the Annual Congress was then received and discussed.

BENMARK (Average annual rainfall, 10.93in.).

July 1st.—Present: 52 members and visitors.

MANURING.—The following paper was contributed by Mr. F. H. Basey and read by Mr. H. Leven:—Before getting down to particulars let us consider the broad principle: Why do we manure? It is usual on average fertile land to take off one or two good crops, whether of fruit, grapes, or cereals, without artificial aid to the soil; but the ensuing yields will show a tendency to fall away. We endeavor, therefore, to replace those elements which our plants have removed in providing fruit, and so maintain a regular succession of full crops and keep the trees and vines in good health and vigorous growth. There are 10 absolutely essential elements to which plants must have access in order to grow healthily and give good yields. These are carbon, hydrogen, oxygen, nitrogen, phosphates, potash, sulphur, magnesia, salts, iron and calcium. We are now concerning ourselves with the phosphates, nitrogen, and potash; but in passing one may note the importance of the aeration of the soil, that ploughing is the efficient means of allowing the air to perform its part, and that the land should not be broken down to a fine tilth too soon, but left in a rough state as long as possible; that is to say, until the necessity for destroying weeds and conserving moisture forces us to work down the furrows. *Phosphate Manures.*—We may very properly take these first, for they have been described as "the sheet anchor of the cultivator of fruits," and the soil of Australia generally is notably deficient in phosphates, which adds to the importance of our proper understanding and application of this type of fertiliser. I take it that there are few, if any, growers in Benmark who do not use phosphates in some form or other, even if they neglect the other ingredients of a "complete manure." What we need consider then is the choice of the best and most economical. And the difficulty for the average grower arises from the expression of the phosphatic acid contents in three forms, namely, "water soluble," "citrate soluble," and "acid soluble." The readily soluble phosphate which is known as superphosphate is obtained by the treatment of ground rock, bones, or guano with sulphuric acid, which brings the raw insoluble phosphate to a condition of solubility. Water soluble indicates that the phosphatic acid is readily released when the manure containing it is brought in contact with water. Citrate soluble indicates the phosphoric acid contents that are released when the manure containing it is left for half an hour in a 1 per cent. or 2 per cent. solution of citric acid. Whilst in the solution it is given continuous shaking. The phosphate that results from the employment of this weak solvent is supposed to be a fair indication of what plants are able in a reasonable time to make use of by means of weak acids in the soil and by substances that exude from roots. Acid soluble indicates phosphate that remains after the "water and citrate

soluble" contents have been removed. Its value is hard to determine. It only becomes available to plants after having been in the soil for a considerable time and then only if ground very finely, so that the roots and the soil acids are able to act upon it readily. As a rough illustration, if you had a pound of hard toffee made up into one block, and a pound of the same toffee made up into pieces the size of your finger tip, you could absorb the latter more quickly than the former by munching the small pieces, whereas you could only tediously lick your way through the big lumps. In general practice it may be taken as sound advice to disregard the "acid soluble" contents in superphosphate, and work out cost in accord with water and citrate. *Unit Values.*—The only sound basis on which to purchase manure is by working out the respective values of the lines offered on the unit basis. Let us consider the first three lines of super in this season's list:—No. 1, mineral super: 36 per cent. water soluble, £5 15s. per ton. Divide the 36 phosphate units into the cost (£5 15s.), and we get a value per unit of 3s. 23d. No. 2, S.A. super: 30 per cent. water soluble, £5 7s. 6d. per ton. Dividing the cost, £5 7s. 6d., by the units we get a unit value of 3s. 7d. No. 3, guano super: 27 per cent. water soluble, 3 per cent. citrate soluble, equals 30 per cent phosphate units certainly available at £5 12s. 6d. per ton. Dividing the £5 12s. 6d. by 30 gives a unit value of 3s. 9d. In this guano super we have taken no account of 3 per cent. "acid soluble" phosphate. We have no indication of the standard of fineness of this residue; it may be in comparatively large fragments and unavailable to the plants for several years. But if it is felt by a grower that it does deserve consideration I do not think the three units should be valued as more than one unit water soluble. Taken on that basis, the manure would give us 31 units to divide into £5 12s. 6d.; equals a unit value 3s. 74d. Now let us compare these three lines:—No. 1 costs us 3s. 23d. per unit, No. 2 costs us 3s. 7d. per unit, No. 3 costs us 3s. 9d. per unit, or 3s. 74d. if we give a value of the acid soluble contents of a third of the water and citrate soluble. Upon this basis of reckoning No. 1 is certainly the best buying; and No. 3, even



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giving it the advantage of the doubtful "acid solubls" allowance, is the worst buying. I must not forget to add that when the freight and charges for landing these manures in Benmark are added, the difference will increase in favor of No. 1, for it costs just the same to bring up the 30 per cent. stuff as the 36 per cent. Let us add 25s. per ton to the cost of No. 1 and 2 and see how the unit values come out. No. 1, 36 units, total cost £7, equals 3s. 10 2-3d. per unit. No. 2, 30 units, total cost £6 12s. 6d., equals 4s. 5d. per unit. On this final reckoning each unit of No. 1 costs 6-3d. less than the No. 2 units. The question often crops up in arguments as to whether the original basis (phosphate rock, bone dust, or guano) makes any difference to the superphosphate that results after these materials have been treated with sulphuric acids. All the information that I have been able to gather from expert sources goes to show that it does not matter what the original substance was, and that the sole guide to the value of a phosphatic manure is the chemical analysis. So that if a bone super and a mineral super both cost £5, and the bone shows 30 per cent. water soluble and the mineral 31 per cent, then the latter is the better value. The phosphate contents of bonedust are solely "acid soluble," and my remarks as to the necessity for the fine grinding of such manures apply here. There is no question that the bulk of the bonedust supplied is vastly too coarse, and even allowing for the 3.25 nitrogen I think it is an over-priced manure at £9 on trucks Adelaide. *Nitrogenous Manures.*—Leaving out the turning in of leguminous crops such as peas and vetches, the principal sources of supply of nitrates are sulphate of ammonia, nitrate of soda, and blood manure. Without going into details, sulphate of ammonia is probably a more suitable manure for use than nitrate of soda and, on the last analysis and quotations I saw, it was the cheapest nitrogenous fertiliser then available. Late American experiments seem to indicate that nitrogenous manures are particularly valuable for pears and apples, and that heavy dressings are a good commercial proposition. There can be no question of the value of nitrogenous manuring of our lands by leguminous crops, but it is probable, to my mind, that on all but our richest box flat country even the best of green crops should be augmented by a summer application of sulphate of ammonia. *Potassic Manures.*—Consideration has only to be given to sulphate and muriate of potash. In pre-war days sulphates used to show a better unit value than muriate, and also had the advantage of being much less saline, and I have always preferred it for our use. But now the only supply of potash available is from the Alsatian fields, which the French have already begun to work, and apparently these only yield muriate, so we have at present no choice. In conclusion: the three plant foods that we have been considering—phosphate, nitrates, and potash—are all essential to the well being of trees and vines, and unless our soil is naturally rich in them we must add some or all. But it is impossible to lay down a rule for general guidance. Every grower must study his own conditions, and if he errs I think he had much better chance too much, rather than too little, manure. The three guiding principles to remember are—nitrate promotes growth in particular; phosphate makes for general health; potash assists particularly in securing quantity and quality in fruit. But potash should never be used alone, as its effect is then spoiled; one or both of the other manures should be used in conjunction, not necessarily at the same time, but within a short interval. In the discussion that followed Mr. Cole thought they should look beyond the immediate cost of manure. The more costly manure might be the more profitable in the end. He favored animal manures, such as bonedust and blood, to mineral manures, because they added humus, in which the river soils were deficient. Mr. Levien said that, speaking broadly, all arid soils were deficient in phosphoric acid. Under irrigation they were expecting the land to do what it would not be called on to do under rainfall conditions. A large tonnage of water was poured on it every year, and a large amount of the essential soil elements were lost by leaching. There was more in manuring than analysis revealed. No analyst could say what quantity of the essential elements in the soil were available as plant food. A lack of potash was shown by a yellow color in the flag of wheat or the leaves of lemon trees; a lack of nitrogen by stunted growth; and of phosphoric acid by a poor crop. He did not believe in the superiority of the water soluble over the citrate soluble forms of phosphoric acid under these conditions, as it went away too quickly. The chief thing under irrigation was to keep up the condition of the soil. There was no need to buy nitrogen when they could grow crops of peas. Potash was

essential, and a certain amount was required each year. Peas and beans were also valuable for their mechanical effect on the soil. If he were in the fruit-growing business again he would use manures only for the growing of cover crops in the orchard, and would rotate the crops, following peas or beans with a non-leguminous plant. Such a rotation tended to keep the soil sweet. If the soil got overloaded with water it became sour and unresponsive, and bacterial action was affected. Proper aeration of the soil was necessary, and the careful use of lime or gypsum was to be encouraged. For citrus, or on light sandy soils, he would grow crops persistently to improve the mechanical conditions of the soil. Mr. F. L. McDougall had noted that sulphate of ammonia and superphosphate had given the best results on the Berri orchard, and asked when was the sulphate applied, and how? Mr. C. G. Savage (Manager of Berri Experimental Orchard) said the sulphate of ammonia, potash, and super were all applied at the same time, when the first irrigation was available, about the 1st of September. The mixtures were tested in small plots, and all the manures were weighed. A furrow was ploughed within about 2ft. 6in. of the vine, and the manure applied in the furrow. Another furrow was turned against this, and water run in it. Mr. H. S. Taylor, referring to Mr. Levien's preference for the citrate soluble over the water soluble form of phosphoric acid, said that the idea of loss through using the water soluble form had been controverted by Professor Perkins at the Murray Bridge Conference, on the ground that the water soluble was turned into the citrate soluble form on contact with lime (which was found in all river lands) in presence of moisture. The loss through leaching was negligible. Mr. F. L. McDougall had consulted Professor Perkins in respect to the value of ground rock phosphate. He had been informed that as it contained only acid soluble and insoluble phosphates it was useless with a light rainfall, but if ground finely enough it would probably be found very suitable under irrigation conditions. With water and warmth it would go back to the soluble form. The speakers, added the speaker, all had an acid reaction, and he thought their soils were acid enough. Ground rock, on the other hand, was slightly alkaline. Mr. G. Quinn (Government Horticultural Instructor) had listened with pleasure to the paper, which was much to the point. Mr. Levien had referred to the comparative cost of the sulphate and muriate of potash before the war, the muriate containing about 61 per cent. and the sulphate 52 per cent. of potash. It should not be forgotten that the muriate contained injurious salts which were already too abundant in their soils; so that the cheaper manure might be the least desirable. American investigations tended to show that the sulphate was the more desirable form to use for trees and vines of fruiting age, the use of muriate tending to depreciate the quality of the fruit. He thought Mr. Levien had confused the effects of potash and nitrogen on plants. The nitrogenous manure tended to produce an excess of growth and green coloring, and South Australian experiments on wheat crops with potash had never yet given returns to justify its use. There was no single instance of potash proving of value for crops, either for hay or grain. He approved of Mr. Levien's idea of keeping the soil in a balanced condition. It was the foundation of fertility to keep up a balance between the organic and mineral contents of the soil, and to make good its lack of humus. Personally, he leaned towards manures of organic origin, but the question of growing manurial crops had a more important bearing than the adding of organic matter to the soil. The fertility of soil depended largely on the liberation of acid substances in it, but they did not want the soil too acid. For bacterial action, soil must have a basic reaction. To liberate the plant foods, acids must be produced in the soil, and the ploughing in of green crops would give rise to carbonic acid gas, which was probably the most active agent in bringing the fertilising constituents of the soil to a soluble condition. By ploughing under peas they were not only adding nitrogen to the soil and making it more friable, cooler, and able to hold moisture longer, and promoting bacterial life, but they were also incorporating organic matter in it. Mr. Levien had suggested the application of fertilisers with the cover crops, and their ploughing in for the trees or vines. That was a good plan. There was nothing lost in that process, by which they put back into the soil all the fertilisers previously applied, plus all those taken up by the plants from the air and other sources. There was a very considerable difference in what different plants put back into the soil. For example, barley and wheat had no nitrogen to put back except what they absorbed in their growth from the soil,

whereas legumes had bacteria attached to their roots and collected nitrogen from the air as well as from the soil. With respect to phosphoric acid and soluble phosphates, remarked Mr. Quinn, it was generally recognised now that the water soluble form was extremely short lived in the soil. Lime present in the average soil seized on the phosphoric acid as soon as it was dissolved, and changed its character to the dicalcic or citrate soluble form; and unless acid was present it would go back to the tricalcic insoluble form. So green crops had a bearing on the utilisation of the water soluble phosphoric acid. Chemists to-day placed very little more value on the water soluble than on the citrate soluble form. That had been taken into account in framing the Fertilisers Act. If a fertiliser failed to show the stated percentage of water soluble, but for every 1 per cent. of water soluble it had $1\frac{1}{2}$ per cent. of citrate soluble, there was held to be no infringement of the Act. Under irrigation the conditions were quite different from those under rainfall; the soil was kept moist, and if crops were worked in, to maintain its organic contents, it would make very little difference whether they used the water or citrate soluble manures. As regards ground phosphate rock, Professor Perkins's proposition was a very sound one. Where the ground was kept constantly moist, and organic matter was present in it, the probability was that it would have a good steady value. Fineness of grinding had a very important bearing on that. In pre-war days the cheapest form of phosphate was basic slag or Thomas's phosphate, which was a by-product in the manufacture of steel. It was formed by a combination of one part of phosphoric acid with four parts of lime. It was naturally very insoluble, but by grinding it to a very impalpable powder it became quite equal to citrate soluble, and in wet soils was preferred to it. So with fineness of grinding rock phosphate might give equal results in wet soil. Fineness was stipulated for in the new Act, according to which the ground matter had to pass through a sieve with a mesh one millimetre, or one-twenty-fifth of an inch, in diameter. They were dealing gently with the manure manufacturer as a start, but when they got used to it the mesh would be reduced, and better results would be got from a mesh of 150 to the inch. Another form of potassic manure was kainit, which was a very crude form of sulphate of potash. Its price was very misleading unless studied on its unit values. It was nominally very cheap, but on its unit values it cost much more than the dearer forms. Its potash content was only about 14 per cent., as against 50 and 60 of the sulphate and muriate, and in purchasing it they would be paying freight on a large proportion of rubbish. Bonedust had a value not only as an organic substance and because of its unit values for phosphoric acid, but owing to the 3 per cent. and over of nitrogen which it contained, and which pushed up the price. With regard to the Berri experiments, the combination (super, potash, and ammonium sulphate) had been adopted to give all the three essentials, because they were all acid in reaction, and could all be mixed together and sown at the one operation. Sulphate of ammonia could be put in earlier than was necessary for the plants without loss. It had to undergo changes in the soil, and be transformed into the nitrate form before it was of use to the plants, and so could be put into the soil much earlier than nitrate of soda, which dissolved very rapidly. With regard to the washing out of fertilisers from the soil, experiments at Rothamstead showed that very little indeed of a phosphatic manure was washed out in drainage. The tests also clearly showed that a large proportion of the phosphates applied to the land, and not withdrawn by the crops, was found in the first foot of soil. Potassic manures showed similar results. Potash combined with other mineral substances in the soil and was held in an acid soluble form, but the nitrates were extremely soluble, and were washed away at once. So nitrate should be applied at a time when the plants could make use of it as soon as it was available. Owing to its lime content, ground phosphate did not increase the acidity of the soil as superphosphate did. Mr. Cole desired to know whether an application of gypsum each year would release enough potash from the soil. Mr. Quinn said that gypsum had given the best results of all lime compounds in that respect, but potash must first be present in the soil. Sandy soils were the most deficient in that respect, whereas clay soils tended to hold potash. It was a curious thing that though the South Australian clay soils on analysis were rich in potash as compared with those of other lands, yet the ashes of the native vegetation were extremely weak in potash. Vine cuttings gave a much greater percentage of potash than their

native plants. In reply to Mr. F. L. McDongall, who enquired respecting the relative values of lime and gypsum under irrigation conditions, Mr. Quinn said that would depend on the nature of the soil. If it was inclined to be sour, lime would be the safer, but otherwise he preferred gypsum as a soil ameliorator and potash liberator.

ROSY PINE.

September 29th.—Present: eight members.

THE MARE IN FOAL.—Mr. G. McCabe contributed a paper on this subject. He said that the period of gestation varied in individuals and sometimes in the same mare in successive periods. No one could state with reasonable accuracy when foaling would take place. The approximate period was usually stated at 11 months or 330 days, but that was by no means constant, and it could safely be stated that it would vary from 322 to 346 days. In extreme cases foaling had been delayed until 400 days had elapsed, and first pregnancy often lasted a year. A farmer who, in his anxiety to give intelligent care to the mare that he believed to be in foal, wished to register the earliest symptoms of pregnancy, should—on the cessation of oestrus or heat—note any enlargement of the abdomen three or four months after, although that was not always noticeable, particularly with fillies. A slight falling beneath the loins and hollowness of the back might have been present, or the udder observed to change in shape, becoming rounded, firm, and free from wrinkles, and the teats more prominent. Those changes in the udder came and disappeared during the period of gestation. A steady increase in weight daily after the fourth or fifth month was a sound indication, as well as swollen and reddish state of the vaginal mucous membrane. After the seventh or eighth month the movements of the foal could be detected by the hand being pressed firmly against the abdominal wall in front of the left stifle. An examination after the mare had a drink, or during feeding, would find the foal moving in the womb. Treatment during the period of gestation should be directed on commonsense lines. A draught mare might be given steady work up to a few days of foaling; in fact, she was all the better for it, but a walking pace should not be exceeded, and any strain or strenuous effort should be avoided, especially as the period of foaling approached. Shaft work was generally associated with possibilities of accident or over-exertion, and should not be done. A liberal supply of sweet food of good quality was essential during the whole period of gestation, and should be steadily increased toward the end of the period, because the foal was daily increasing its demands for nourishment—a fact that had to be remembered when feeding. Further, increased activity was noted in the udder, where milk was being secreted for the foal, and a class of food likely to stimulate milk production was required at that stage, especially lucerne. The bowel discharges should be watched, and constipation corrected by bran mash and green food. The main diet had to be arranged in order to meet the demands of the mother and foal. Good chaff, a little grain, and other foods rich in those elements which formed flesh and bone would be required to supplement grazing. Lucerne was always a useful adjunct to any ration, not only because it afforded protein for flesh formation but also because it stimulated the flow of milk. Towards the latter portion of the period of pregnancy the muscles of the hindquarters fell away from the buttock, and a shrinkage of the hindquarters and flanks became evident. Care should be exercised to avoid any class of work entailing excessive fatigue or sudden movements, also jerky exertion. It might safely be laid down as a rule to work draught mares to within a fortnight of their expected time of foaling. In this country, where sunlight with its healthy influences was so much in evidence, mares were allowed to foal in clean, well-grassed paddocks, in which there was shelter, shade, and a good water supply. Precaution should be taken to see that the mare was not disturbed; she was best kept alone, because the presence of other horses often created undue apprehension. The ordinary symptoms of approaching parturition were familiar to most breeders. The abdomen became more pendulous, the udder enlarged, the teats thickened and extended, and the muscles of the croup less prominent, while the lips of vagina enlarged and appeared slightly parted. Often there was a viscid discharge. The waxy substance found on the opening of each teat dropped off about 24 hours before foaling, and milk would flow from each teat on the application of pressure. At times the teats did not fill until after foaling.

Sometimes the wax on the teats was absent, and yet again in other cases the usual symptoms of milk formation in the udder were delayed until after foaling. When the time approached for foaling the mare became excited and uneasy. Lying down, elevating the tail, and straining were all marked symptoms of pain. Those became more frequent until the climax was reached. Natural parturition was rapidly and easily accomplished. A mare might be seen grazing comfortably, and on revisiting her half an hour later she might again be found complacently grazing, but with her foal at foot. He advised giving the mare at least one bran mash daily for two or three days, the aim being to avoid giving her any class of dry food likely to cause constipation. The after-birth, which, as a rule, was naturally ejected in from three to eight hours after giving birth to the foal, should be buried or burnt.

WAIKERIE (Average annual rainfall, 8.89in.).
September 3rd.

PRUNE GROWING.—Mr. J. L. Smith contributed a paper on this subject. He said he had planted 50 trees each of the Splendour, French Golden Valley, and Fellemberg varieties. The second variety had produced three successive good crops. The pruning of the tree was very simple; the laterals should be cut back and a certain amount of upright growth allowed to keep the sun's rays from scalding the bark. The Golden Valley variety was a vigorous grower and a heavy bearer. Sixty pounds of green prunes would "dry out" 27lbs. of dried fruit. The fruit was easy to harvest. It should be left on the tree until properly ripe, then if the limbs were shaken it would fall into the hessian. He dipped it in a light caustic solution and placed it on trays, one prune deep, and allowed it to dry until it began to toughen. It should then be dipped in a lye of 56galls. of water, 18lbs. black sugar, 1lb. of salt, and 5lbs. prunes (molasses could be used in the place of the sugar). Those ingredients should be boiled well together before the fruit was dipped in it. The fruit should be placed in the solution for 20 seconds and then placed on trays, and allowed to remain for about two days. Weather conditions did not interfere with the drying, and the rain could not injure the fruit. He thought a person could not grow a more profitable tree, provided he got the right class of prune. He had found it necessary to spray on account of the red spider.

BERRI, September 27th.—The delegates to the Adelaide Congress gave a report of the proceedings, which was greatly appreciated by members. Mr. P. M. Wilksh exhibited a cinchuring knife that would cut a strip of bark and remove it in one operation.

BRINKLEY, September 25th.—Mr. A. B. Martin read an article from the *Journal of Agriculture*, and an interesting discussion followed. The report of the delegates to the Annual Congress was received and discussed.

COOMANDOOK, October 1st.—The delegates to the Adelaide Congress gave a report of the proceedings at that gathering, and an interesting discussion took place on items of interest to scrub farmers.

LONE GUM, September 28th.—The meeting took the form of a "Question Box," when several items of local interest were brought forward for discussion. Messrs. H. S. Taylor and H. Berriman of Renmark were present, and gave the members the benefit of their experience in dealing with various diseases of vines.

PARILLA WELL, October 4th.—Mr. J. S. Ferguson gave a detailed report of the Adelaide Congress. Several matters reported on were discussed by members, particularly the practice of drilling in super in summer on fallowed land. That was considered suitable for the cropping of small areas only, and in heavy country where the drill could be used a second time. Broadcasting seed was considered wasteful, and irregular, in comparison with the work of a drill.

WYNARKA, August 7th.—COMMERCIAL ORGANISATION.—Mr. Rackham contributed a paper dealing with the "Commercial Organisation of Farmers." He drew attention to the need for some better system of sale and purchase, and he suggested that the pooling system was that best calculated to deal with the wheat crop. Members agreed with the principle of a compulsory Wheat Pool.

WYNARKA, August 28th.—Messrs. Blacket and Murphy gave interesting accounts of their observations on farm life in England and France.

YOUNGHUSBAND, September 27th.—The first meeting of the Younghusband Branch was held in the local hall. Mr. F. C. Richards visited the Branch and addressed the members on "The Work of the Agricultural Bureau." At the conclusion of the address the officers were elected and a programme of meetings was arranged.

SOUTH AND HILLS DISTRICT.

BLACKHEATH.

September 25th.—Present: 10 members and visitors.

FARM GATES.—The Hon. Secretary (Mr. R. S. Talbot), who read a short paper dealing with this subject, said either wooden or iron gates were very serviceable, but at the present price of all metals iron gates were out of the question. A wooden gate 12ft. in width would, he thought, serve the purpose for most of the farmers in that district. Gates of a greater width should be made in two sections to prevent them from sagging and straining the posts and hinges. If the wooden gates were occasionally painted they would last very much longer and give the homestead a neater appearance. For stock panels all that he thought necessary was a gate made of five plain wires with a barb on top, so constructed that it would open easily and have a tidy appearance. The speaker made a strong point of not using a barb wire on the bottom of the wire gates, because of the danger of injury to livestock. The report of the delegates to the Annual Congress was also received and discussed.

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CHERRY GARDENS (Average annual rainfall, 35.03in.).

September 28th.—Present: 12 members.

SHEEP VERSUS CATTLE.—Mr. A. Broadbent contributed a short paper on this subject, dealing with the advantages of either animal. He preferred keeping sheep because they involved less trouble, and returns would be forthcoming each year. They would clear the ground of briars, broom, furze, and other weeds, and they could be killed for meat at any time. A good sheep-proof fence was essential, and also plenty of water should be provided. A good discussion followed. Mr. C. Ricks advocated the keeping of cows on small areas where labor was available. Also, in a broader sense, he considered it was better for the country in that it provided employment for more labor and kept more people upon the land.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

September 18th.—Present: seven members and nine visitors.

THE WHITE LEGHORN: FROM CHICK TO PULLET.—The monthly meeting of the Branch was held at Mr. E. W. Beythein's residence. After an inspection had been made of the poultry runs and incubator houses, Mr. Beythein read the following paper:—'Success in egg farming hinges mainly on a person's ability to raise healthy chickens from the shell to the laying age—the first five or six months of the pullet's life. Because of the fact that no financial returns can be expected during this period there is a natural tendency to neglect the chicks as much as possible, the result being a survival of the fittest, and even those that do survive are in many cases only stunted runts which are of very little value as egg producers. A chicken, unless well nourished with easily digested food and every attention given to its bodily warmth and comfort, cannot be expected to develop into a robust egg-producing pullet. The treatment during the first six months of a bird's life either makes or mars it as a profit earner for all time, because all chicks from eggs of well-mated vigorous parent stock come into this life as well developed and fitted for the stern battle before them as any other thing on this earth; but fed improperly or kept in stuffy and dirty brooders at suicidal temperatures, or through being unfortunate enough to have weak parents on one or both sides, the reverse conditions can only be expected. It seems to me that in laying out a poultry run at least one-half of the money available could be well spent in brooder houses and accommodation for the growing stock, for a pullet well nourished and well grown will stand an astonishing amount of neglect and hardship during the rest of its life, and still be bright and profitable. Once in the brooder it is not a difficult matter to raise the chicks successfully, but on no account should food be given before they are at least 48 hours old, and as a precaution against this, it is better not to remove them from the incubator nursery until the 23rd day. After this, however, any good chicken grain mixture may be fed sparingly in a little chaff and sand four or five times a day. Finely crushed sharp grit with charcoal and cool clean water must always be before them. When a week old, moist crumbly mash, mixed with skim milk and containing a little meat and bone meal should be fed twice daily in addition to the scratch grain mixture. Finely-chaffed tender green stuff should also be fed regularly without fail. Chicks should be brought up on an abundance of green stuff, as they will eat more of it when adult fowls and thereby save nearly half the food bill. Overfeeding in the day time should be avoided, as it tends to make the chicks sluggish and gets them into the habit of moping around the hover from one feeding time to another, instead of which they should be actively scratching all day, so as to develop sturdy frames and vitality, and being so much in the fresh air they are certainly healthier and not so liable to bowel troubles. In chicks bred from healthy, vigorous stock, bowel trouble arises chiefly from overfeeding, combined with the bad, stuffy air of a badly ventilated brooder, or through chills caused whilst the birds are wet and exposed to cold and bleak winds in badly sheltered runs. With either of these causes bowel troubles nearly always result, and then comes the clogging of the vent and the wasting, if not the death of the chick. Brooding chicks is an art no careless person can ever learn, and numbers of good pullets are ruined each year through faulty brooding. The temperature under the hover should at all times be high enough to prevent overcrowding, and at the same time the hover should be

well ventilated so as to keep the air fresh and pure. However, the sooner the chicks can be made to do without artificial heat the better, for after a certain age it tends to weaken and lower their vitality. They should be gradually hardened off by reducing the temperature under the hover. After the first month, free range should be allowed the growing stock, as they thrive much better under such conditions. The cockerels should be culled out and the pullets should now be fed, in addition to their scratch grain feed, the ordinary laying ration of adult stock. I am a firm believer of this, because, besides developing the frame of the bird, I think the egg-laying organs should also be developed to the same extent in the growing pullet, so that when the egg-laying stage is reached the bird is in perfect condition throughout and ready to perform its life work. It will be noticed in some strains that the laying stage is reached much earlier than in others, but whenever it arrives, on no account should one endeavor to do such an unnatural thing as to try and stop the egg production. A set back of this sort can only be more or less injurious. If a pullet bred from sound, mature stock wants to lay at from four and a half to five months, let her lay. The eggs at this stage are so small that they can do her no harm, and it is only the natural outlet for her surplus vitality. It will be found that after laying a dozen or so eggs she will ease up of her own accord, take a rest, and then start afresh with normal sized eggs, whilst other birds of the flock are just beginning to make a start. The early layer is the bird with vitality and a natural tendency for egg production, and as such, should be lag-handed and kept under observation during the first year, to make sure that in other respects she comes up to the standard for the breeding pens. The parent stock must at all times be sound, vigorous, and correctly mated, with generations of breeding behind. Maturity is absolutely essential. Mash should always be fed to growing pullets in the evening, and they should be encouraged to then distend their crops to the fullest extent. This causes them to grow up with a big stowaway, and is most necessary, for a bird must be a big eater to be a heavy egg-layer. Regarding the time for hatching pullets to obtain best results—certainly, climatic conditions and seasons play a great part, but the records from the following tests carried out by me should prove interesting. All the pullets were hatched from the same parent stock:—Twenty-five pullets hatched August 1st, 1914, laid at four months to five months old; average per bird—first year, 227 eggs; second year, 184; third year, 189. Thirty pullets hatched September 1st laid at five months to six months; average per bird—first year, 206 eggs; second year, 187; third year, 178. Thirty pullets hatched October 1st laid at six months to seven months; average per bird—first year, 198 eggs; second year, 168 eggs; third year, no record. Twenty pullets hatched November 1st laid at seven months to eight months; average per bird—first year, 164; second year, 157; third year, no record. Forty-five pullets hatched April 1st, 1915, laid at five months to six months; average per bird—first year, 93 eggs; second year, 159; third year, no record.

MOUNT BARKER (Average annual rainfall, 30.93in.).

September 22nd.—Present: 70 members.

VEGETABLE GROWING.—Mr. H. D. Strange, of the Cherry Gardens Branch of the Agricultural Bureau, contributed an interesting paper entitled "Vegetable Growing," after which a number of questions were asked by the members. Mr. Strange favored the Pinkeye variety of potatoes. Carmens, he said, also yielded well. In regard to manures, he thought that bonedust was the best for ordinary use and blood manure for forcing, whilst for cabbages sulphate of ammonia was excellent. For blight in cabbages he considered the soapbuds' treatment the most effective remedy. He thought the best variety of peas to grow was Te Aroha. That was a very heavy bearer, and often yielded so many as 10 peas in a pod. In regard to the use of gypsum as a manure, Mr. Smith (Inspector of Orchards), of Angaston, said it was more an assistant than a manure, and acted in the same capacity as lime. The land in that district was deficient in lime, and he believed that if lime or gypsum were used it would prove beneficial in destroying sorrel. Mr. Strange would plant potatoes 12in. apart along the rows, but Mr. Jos. Pope considered that was too close. Tomatoes did not need extensive pruning in the hills districts; all staked tomatoes, however, should be pruned.

ASHBOURNE, August 30th.—The Chairman (Mr. J. H. Potter) addressed the members on "Breeding," dealing mainly with the finer and technical points of the subject. He also mentioned a good system for a "foundation" for breeders who intended to raise pure-bred stock.

ASHBOURNE, September 22nd.—Mr. C. H. Beaumont (Orchard Inspector) visited the Branch and gave an address, "Spraying Fruit Trees."

CYGNET RIVER, September 23rd.—Mr. H. W. May read an interesting paper, "Trees for Breakwinds," and a good discussion followed. The report of the delegates to the Annual Congress was then received.

IRONBANK, September 25th.—The Chairman (R. Coats) read a paper from the July issue of the *Journal of Agriculture* entitled "The Treatment of Horses' Teeth," and a good discussion followed.

MACGILLIVRAY, August 26th.—Mr. H. J. Wiadrowski read an interesting paper, "The Eucalyptus Oil Industry of Kangaroo Island." A good discussion followed.

MEADOWS, September 29th.—Mr. C. H. Beaumont gave an interesting address in which he pointed out the necessity for draining the hill soils that were intended for fruit-growing. He considered that district was admirably suited for fruit-growing, but stagnant water was the cause of failure; it checked the growth and gave the trees an unhealthy appearance. Drains should be at least 70ft. or 80ft. apart, and at a depth of 3ft. 6in. to 4ft., with a fall of at least 1ft. in a hundred, and a good outlet. Another advantage in having the soil drained was that it kept the soil warmer. Mr. Beaumont also gave the names and causes of disease in fruit trees, and the remedies for same.

MOUNT PLEASANT, September 10th.—The subject of summer fodders was brought before the meeting for discussion. Mr. Tapscott advised that he had sown Paspalum on the black rich soil of his property. Messrs. Maxwell and Thompson mentioned that they intended sowing Sudan grass. In reply to a question as to the merits of early and late shearing members were of the opinion that the fleece should reach a certain maturity before it was taken off. It was decided to draw up a programme for future meetings of the Branch.

SOUTH-EAST DISTRICT.

FRANCES (Average annual rainfall, 20.74in.).

August 28th.—Present: nine members.

FARMING PRACTICES.—In the course of a paper under the title of "Farming Experiences in the Binnu District by an Old Resident," Mr. J. C. Brown first gave an interesting account of that district in the early stages of settlement, and told of the contrast in conditions between country north of Adelaide and that in the South-Eastern portions of the State. In the past their district had been regarded as a purely pastoral proposition, but he believed that with sound agricultural practices it could be made a first-class agricultural and pastoral area. Every farmer should put at least one of his paddocks under fallow as soon as ever the conditions of the land made that permissible. He would suggest ploughing, under average conditions, to a depth of about 3½in. to 4in., but that depth need not be regarded as a hard and fast rule. The soil in their district consisted chiefly of two kinds—land containing a number of crabholes and loamy soil. The first mentioned was generally difficult to work, but would nearly always yield a good payable crop if worked systematically. The land should be first ploughed and then harrowed in both directions. Next, a grader should be used, and during the summer the paddock should again be worked with the plough. The work with the harrows should then be repeated. He then suggested hiring a road grader from the local district council and making straight drains, about 4 chains apart, through the paddock. After the first good rain the seed should be sown and super used at the rate of 100lbs. to the acre. An interesting discussion followed.

KYBYBOLITE (Average annual rainfall, 22in.).

September 23rd.—Present: 19 members.

The delegates to the Adelaide Congress gave an interesting account of the proceedings, after which the Secretary (Mr. E. Salvason) contributed a paper entitled "Stomach Diseases of the Pig." The cause of indigestion, he said, was want of exercise, too much food, or food that was of poor quality. The animal should be given plenty of exercise; young pigs especially should be fed regularly and sparingly with nutritious food. The symptoms were (1) a craving for things it did not touch when healthy, such as wood, shown by eating its trough, and (2) putting its nose on the ground and squealing, or vomiting up a thin sour-smelling liquid mixed with masticated food. In chronic cases the pig staggered from giddiness and fell over. In young pigs it caused fits, and the pigs would not thrive. If the pig was constipated it should be given 1oz. or 2oz. of Epsom salts and a teaspoonful of ginger in half a pint of water. Where diarrhoea was present he would give one or two tablespoonsful of castor oil or from a dessert to a tablespoonful of tincture of rhubarb. After the physic had operated one could give a tablespoonful of tincture of gentian and ginger three times a day, or five drops of carbolic acid in a little sweetened water. That would be found useful if the pig was vomiting. Gastritis or inflammation of the stomach was caused by the pig eating indigestible food which set up irritation, or by caustic medicines. The symptoms were vomiting, great pain, and restlessness; sometimes the pig would squeal, refused to eat, but would drink. The vomited material from the stomach contained bile or mucus tinged with blood; the nose was dry, and if one examined the tongue it would be found to be coated with whitish fur; the bowels were constipated, and the pig sometimes became delirious. If possible the cause should be found. If strong acid was the cause, the animal should be given carbonate of soda or lime water, plaster from the wall, or whitewash from the wall mixed in water, and given as soon as possible. If the cause was alkali, it should be given

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vinegar, then flax seed, barley water, or gum arabic dissolved in water or, if nothing else was available, milk, then 10-15 drops of opium. One should give that in any case of the disease. If it was caused through bad feeding, give 1oz. or 2oz. of castor oil, followed by linseed tea or gum arabic dissolved in water. When vomiting was troublesome, give 5-10 drops of medicinal solution of prussic acid in a little water, or a few drops of wine of ipecac., and allow the pig all the cold water it required. Ulceration of the stomach was an independent disease, but at times came in conjunction with other diseases. The pig vomited occasionally, blood being present; the appetite was variable; sometimes the animal would begin to eat with relish, then all at once appear to be in pain. The bowels were usually confined, and the urine of a high color. Treatment consisted of subnitrate of bismuth in 10gr. doses three times a day, to be given on an empty stomach. Half a grain of nitrate of silver and half a grain of opium was also a good remedy, and should be given before feeding.

LUCINDALE (Average annual rainfall, 23.32in.).

September 4th.—Present: 14 members.

EXPORT OF MERINO RAMS.—Mr. Cottell initiated a discussion on this subject. He pointed out that some of the best Merino rams of South Australia were being purchased by South African pastoralists, who had discovered that the Merino sheep of South Australia thrived under their conditions. He believed it to be a short-sighted policy to allow the best stock to be exported, thus affording other countries an opportunity of competing with Australia in the wool markets of the world. Much of the work performed in South Africa was done by black labor, and consequently they were able to produce their wool more cheaply than the Australians. He cited the case of the wattle-bark industry and how South Africa had secured seed from Australia. The people of South Africa were now able to produce the bark and sell it to Australians at a lower cost than the bark could be raised in Australia. Such a practice had tended to cripple the bark industry until the Government stepped in and placed an embargo on African bark. It was pointed out that the South Africans were protecting their Angora goat industry by placing an export tax of £100 on every Angora goat exported out of their country. He believed that some similar scheme should be adopted by the Commonwealth of Australia, to protect the interests of the Merino wool producers. Mr. P. Dow also spoke in support of Mr. Cottell's arguments.

MUNDALLA.

September 30th.—Present: 24 members.

ANNUAL MEETING.—The annual report of the Branch was read, as follows:—This Branch was formed in September, 1916, with an enrolment of 10 members. To-day our enrolment is 35. From a Bureau point of view we have come to the close of a very successful year. Great interest has been exhibited by members, all of whom have shown that they recognise the mutual help obtainable from the Bureau. The enthusiasm and goodwill have been excellent. Each meeting this year has been full of interest, and some very interesting and instructive papers have been read. In January last the members were asked by Mr. Alcock to contribute to the South-Eastern exhibit; this was done with considerable success. We have already promised to hold it again next year, and steps have been taken to that end. The following papers have been read, "Cutting and Stacking Hay," by Mr. Evans; "The Development of Modern Agriculture," by Mr. Hodges; Mr. Roy Saxon gave a very interesting talk on "Wool-classing," illustrated by some very fine specimens of wool; "Seeding Operations" was given by Mr. G. H. Saxon; while Mr. D. A. Low gave his experience of the pruning operations this season. Considerable discussion was initiated by Mr. F. R. Dinning on his producing various samples of wool, and explaining the different points. Mr. McGrice followed with some information regarding the treatment of "Scrub Sheep." Mr. Donnell's paper on "The Fruit Garden" was much appreciated by members, who benefited to the extent of many practical hints. Mr. E. Milne gave an interesting paper on "Fallow," while Mr. A. Ross gave a practical paper on "Sand in Horses." The question of the Olive Industry was introduced by Mr. McGrice, and we are now waiting for the visit of an expert to get his advice on the matter. Other local matters were discussed from time to time. One can see by the above that the value of the Bureau cannot be overestimated. Information of the most

valuable kind is distributed, and each member is striving to do his best for his fellows, and we trust that with this continued co-operation of aims and ideas we shall experience as successful a year as the one just closed. Mr. E. Knowling then gave an interesting report of the recent Congress held in Adelaide.

NARACOOORTE (Average annual rainfall, 22.60in.).

September 11th.—Present: 17 members.

Mr. E. S. Alcock (Superintendent of Experimental Works in the South-East) read a paper, "Growing of Green Fodder Crops." The subject of "Sugar Beet Growing" was also brought before the meeting for discussion. The following is the programme of meetings compiled for the session ending July, 1921:—November 13th, "How to Lay Out Farm Paddocks to the Best Advantage," Mr. J. M. Wray; December 11th, "Handy Hints," members of the Branch. 1921.—January 8th, "With the Light Horse in Palestine," Mr. J. D. Mantou; February 12th, "Early Green Feed, Dairying, and the Value of Irrigation," Mr. C. Drake; March 12th, "Mixed or Combined Farming," Mr. W. Loller; April 9th, "Most Profitable Breed of Fowls for the Average Farmer," Mr. F. A. Holmes. May 14th, "Advantages of Agricultural Clubs for Boys and Girls," Mr. C. J. Jenner; June 11th, "Book-keeping for the Farmer," Mr. A. C. DeGaris; July 9th, Annual Meeting.

TANTANOOLA.

July 31st.—Present: 15 members.

BEE KEEPING.—Mr. W. Hart, who contributed a paper on this subject, recommended the intending beekeeper to first purchase the following outfit:—10 complete Langstroth hives, 10 frames, foundation starters, cover, and Bolton board. If he wished to secure the bees easily all that was necessary was to place the hives in some shady position away from stock during the months of November and December. On the other hand, if the farmer did not wish to wait for "chance swarms" it would be necessary for him to purchase them from a reputable apiarist. He also suggested the purchase of a tested Italian queen bee, and from her the beekeeper could breed queens for the hives. After a knowledge of the introduction and rearing of queens had been obtained, it was a good plan to number each hive and keep a record of the yield of honey received from each swarm. Other necessary utensils were:—One honey extractor, one two-framed knife heater, two uncapping knives, one uncapping can and strainer, tank to hold 300lbs. of honey, bee veil, and smoker, and tin comb baskets. In addition, supers should be purchased. When the bees had filled the bottom hive they would go into the super, draw out the combs and fill them with honey. The honey should not be taken until at least $\frac{1}{2}$ of it had been capped over. The nine frames should on no account be taken from the super at the same time, excepting when the winter season was approaching. A man keeping 10 colonies of bees should take on an average 60lbs. per hive, and if, on examination, he found that some of the hives were only making about 20lbs. of honey such swarms should be "requeened" in the early spring.

MILLICENT, July 11th.—A discussion took place on the destruction of box-thorn in the South-Eastern district, and also on the local cultivation of sugar beet.

MOORAK, September 29th.—SUGAR BEET INDUSTRY.—The Hon. J. Livingston gave a very instructive and interesting address on the possibilities of the sugar beet industry in the South-East. Mr. Fairweather also spoke on this subject, and gave his experiences whilst on a tour with Mr. Livingston at the Maffra works. Mr. Fairweather was of opinion that sugar beet was a very serviceable fodder for dairy cows and other stock; there was also very little waste whilst using it.

PENOLA, October 9th.—The delegates appointed to attend the Adelaide Congress (Messrs. Kidman and Hinze) gave an interesting report, and also an account of their tour of the irrigation settlements on the Murray River. Mr. Patchell also gave a report of his visit to the Roseworthy Agricultural College.

SANDALWOOD, September 25th.—Matters in connection with the forthcoming Conference of Murray Lands Branches were brought before the meeting, and a programme of meetings for the conclusion of the year was compiled.

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Full particulars are published in the *Government Gazette*, or may be obtained, with plans on application to the Secretary for Lands, Adelaide.

LANDS TO BE OFFERED SHORTLY.

Additional allotments in the town of Whyalla (Hummock Hill) will be offered at auction at an early date.

Full particulars will be published in the *Government Gazette*, and plans will shortly be available on application to the Secretary for Lands, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portion of a block, if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey.

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Notice is hereby given that in future no applications for land, or for transfer, sublease, of mortgage of Crown leases or agreements will be approved to unnaturalised persons of any nationality, or to naturalised persons of enemy origin unless the consent of the Honorable the Attorney-General of the Commonwealth be first obtained by the parties making the application.

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OFFICIAL LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which may be seen at the principal Post Offices, and copies obtained at the Office of the Secretary for Lands. The List shows the Areas, Localities, Prices, &c., of the Sections available and the conditions under which they may be applied for.

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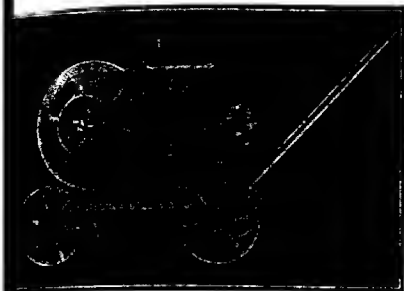
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